



Waring (W. R.)

REPORT

TO THE

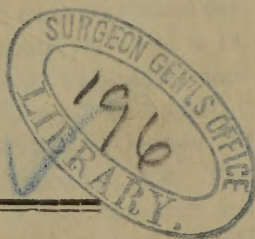
City Council of Savannah,

ON THE

EPIDEMIC DISEASE

OF

1820.



BY

WILLIAM R. WARING.

[PUBLISHED BY ORDER OF COUNCIL.]



SAVANNAH:

PRINTED BY HENRY P. RUSSELL.

1821.

REPORT

TO THE

Sanitary Commission of the

ARMY

EPIDEMIC DISEASE

OF

1860.

BY
WILLIAM A. HENNING

[PUBLISHED BY ORDER OF CONGRESS]

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PRINTED BY HENRY T. RUSSELL

WASHINGTON

1861

REPORT, &c.



IN compliance with the appointment of the Council, I have composed a Memoir concerning the causes, character, and treatment of the late Epidemic. It is not very brief, in the place of a common Report; but it has been contracted into as narrow bounds as could possibly comport with the nature of the subject. The Disease made its appearance in May. A death occurred on the 7th, another on the 10th, and another on the 30th of that month. In June, the mortality was augmented to a death on every second day, and the whole sum, at the end of the month, amounted to 14. In July, the number of deaths ran up to 39, being an advance to more than double the devastation of June. In August, it amounted to 111—in September, to 241—in October, to 268—in November, to 50—and in December, to 3. The degree of mortality, on the surface of this statement, appears to have undergone a gradual reduction after the month of September. But when it is considered, that, in the course of this period, the population had been greatly diminished by absence and death, it becomes evident, that, so far from having sustained any diminution, it was really increased throughout the month of October. The whole aggregate of deaths resulting from the Epidemic, from its commencement in May, to its conclusion in December, is thus estimated at 666. The yellow fever of 1793, in Philadelphia, destroyed near 5000 people; so that, reckoning the Inhabitants of that City at 50,000, the mortality would amount to the proportion of one in ten. When the late Epidemic first appeared in May, the

population of Savannah may be computed at 5,000 whites. In June, and beginning of July, it was probably reduced, from emigration, to 2,500; and, on the 14th of September, when the Mayor's proclamation was published, the number was still further reduced, and could not have exceeded 1,500. The medial population, therefore, of white Inhabitants, may be fairly estimated at 3,000, for the whole season; which would constitute a sum of mortality amounting to one in five, and just doubling that of Philadelphia, in 1793. Such an enormous sweep of human life, has scarcely a parallel in the medicine of Europe, or America. The Epidemic of the present year commenced unusually early, in a comparison with others of a date prior to 1817. In former times, and antecedent to this period, the season, commonly denominated the *sickly season*, was not expected until the latter part of July, or beginning of August. The month of July, 1816, was, I believe, the most prominent for its health and pleasantness in that year; and the late Dr. JNO. GRIMES informed me then, that it was not a casualty, but a general and expected occurrence. In 1817, some vicissitude seems to have been established, for the Epidemic began to develope itself very early, and, before the expiration of July, had been propagated widely and fatally. The Epidemic of 1818, scarcely deserves to be called so. For, although bilious fever did in some instances take place, and was the genuine product of the period, yet it was mild, sporadical, and the bare testimonial of its annual return. Such as it was, however, it commenced to declare itself even in Spring, and, in a few cases, terminated in death. The Epidemic of 1819 made its appearance under a distinct shape, in the latter part of June, and went on increasing in extent and destructiveness, until the frost came and ended it. I make these remarks in regard to the anticipated birth of those Epidemics, because I shall place that circumstance among the co-operating causes which have produced the disease of 1820, when I come particular-

ly to discuss its origin. Throughout the months of June and July, the late Epidemic was bilious and remittent in its general complexion. It was the ordinary malady of other seasons, featured with the wonted symptoms, and pursuing the common course. But there was a grade and form more violent and deadly, assumed at first in solitary instances only, and always preserving some characteristic of alliance to the ruling type; which grew, step by step, in extent, and finally spread its dominion every where. This terrific contour of the disease, was distinguished by its unabating continuance, by its black emissions from the stomach, and by its inflamed eye. It was evidently the Epidemic Remittent, propelled into this aggravated shape, by the violence and consequent intercurrence of paroxysms. In the first place, Because the black ejections from the stomach, which were incident to it, were frequently attendant on cases accompanied with remissions. Second, Because, in many instances where no remission could be distinguished, there was a total absence of black evacuations, either from the stomach, or lower intestines. Third, Because the majority of cases were connected, in the first stage of their progress, with discharges of bile, which were sometimes copious, although afterward they became suppressed entirely, as the disease rose to the summit of its strength. Fourth, Because, in some cases, by the tendency of the attack, or by the imprudent administration of acrimonious substances, the remittent was excited into the continued form, and the character which was assumed in the onset, became finally obliterated. Fifth, Because, in some cases, which were genuinely continued until the force of the disease was in some measure exhausted, and the constitution beginning to triumph in a recovery, the remittent garb was gradually and eventually completely disclosed and established. Sixth, Because the inflamed vascular membrane of the stomach was the source of the black ejections, and that inflammation was repeatedly ascertained, by the morbid dissec-

tion, to exist with profuse secretions of bile, and without the production of one particle of black matter. Seventh, Because, in connexion with this inflamed state of the stomach, and abundant secretion before death, and presence of bile after death, without any appearance of black matter, there was sometimes not a mere remittent, but the exhibition of a perfect intermittent form of fever, such as is ordinarily witnessed in every season. Eighth, Because it appeared, after death and dissection, in a case of remittent fever, that there was inflammation of the inner coat of the stomach, with small parcels of black matter upon its surface, while the cavity of the stomach was filled with green bile, and the *duodenum* with deep yellow bile; thus evincing, in the most decisive manner, the unity of the bilious and black vomit forms of the Epidemic. Ninth, Because, at the winding up of the season, the Intermittent and Remittent forms of the disease became more numerous, while there was a corresponding diminution of the Continued cases, which had been predominating. This fact could only be explained by the general mitigation of the Epidemic, which the cool weather had effected, and which was the suitable result of a reduced state of the morbid causes. Tenth, Because, in the same family, and under the same roof, all the varieties of Intermittent, Remittent, and Continued fever, were sometimes simultaneous. In the family of Mr. T. V. GREY, there was one servant affected with common fever and ague, another with a severe remittent, and a third with a continued fever, ending in black vomit, at the same instant. Is it possible to conceive, that there were three distinct atmospherical sources of disease in this narrow compass? If the case of black vomit be sundered from the Intermittent and Remittent cases, and ascribed to a separate agent, then the Intermittent and Remittent must consequently be sundered from each other, and, with equal propriety, be also ascribed to separate agents. Eleventh, Because, in all epidemical diseases, there are mild as well as

mortal cases. Now, the advocates in general, for the nosological distinction of the continued form of fever, in combination with black vomit, have neglected to point out and define the mild cases which eventuate in the restoration of the patient. I have yet to learn what they are. For, in the season which has just elapsed, there seemed to be very little difference. The event was almost universally mortal, where black matter was ejected from the stomach. Even the Plague of Constantinople and Cairo does not destroy all. The natural small-pox presses with a heavy hand on some, but, in others, it is kind, and does not even disturb the tranquility of the general circulation. Influenza, in some cases, is nothing more than the slightest catarrh; while, in others, it engorges the lungs, and prostrates the strength, even to death. All those Epidemics which are well understood, seem to be governed according to the principle of variety, in force, and grade and features. None is positively and inflexibly defined by fixed points and lines. Is it not probable, therefore, independently of other considerations, that the continued fever of black vomit is subject to the same principle also? That it is not always fashioned by an unbending and deadly pattern; but, in the same manner, varies its outline, and sometimes invades the system with a part only of the ordinary violence? This is rendered still more probable, by its correspondence with a general law, which governs the operations of the human body. There is not an active substance of the *Materia Medica* which constantly preserves an uniform influence over every constitution. Habit, predispositions and internal peculiarities of structure, are as various as the external figure. Seldom are two frames susceptible of similar movements, from the action of the same cause, and nothing is more common than different depths of impression, not only in different systems, but even in the same system, at different junctures. All medicines, all articles of food and drink, are employed in practice, under the control of this

law. All poisonous remedies are subject to it; for it is as much a constituent part of the physiological body, as any of the vital functions. It were then indeed a strange circumstance, if a poison, which happens to be diffused in the atmosphere, a *miasma* of bogs or foul heaps, should be made of such a flexible material, as to defeat the usual tendency of that law, and to adapt itself to all the differences of susceptibility, or arrangements of predisposition, in such manner as to produce always the same effect of grade and form. There is an accommodating power in the body, which gradually, but not promptly, and often unsuccessfully, tends to fit it to exigencies, and to the forces which are exercised by the agents which operate on it: but there is no such convenient power of compliance, in any degree, in agents to the various states of the body. Their character is immutable, so that it is not possible for them to raise up the same morbid affections in every instance. What, then, are the minor effects of that cause which produces continued fever and black vomit, if they be not the bilious Remittent and Intermittent forms of fever? These have been the only forms of disease associated with them, and they have been the only obvious milder effects which it could have produced.

The Epidemic began then as mild and manageable Intermittent and Remittent bilious fever. In the course of its march, it became a remittent, more severe and fatal; at another step, a continued fever, most ungovernable and destructive, at first of short, but afterward, in some instances, of considerable duration; and, finally, concluded with a relapse into the primary Intermittent and Remittent types. I have said, that, almost from the moment of its declaration, certain cases were appalled in the continued dress. The first which came under my notice, occurred on the 26th of June, in Washington Ward, which is situated at the north-east point of the City. There was some appearance of a periodical remission in this case, but it was not very distinct or well marked, and the Patient

died on the third day. I have often seen examples, at a late period in other seasons, of cases running thus rapidly to a close, and was contented with accounting for its early occurrence, by some extraordinary exposure, or intemperance. On the 14th July, a Mechanic was attacked with Continued fever, in the same Ward, and died on the fourth day, with hæmorrhages from the nose and bowels, with a spongy state of the gums. About this time, Mr. PATRICK STANTON, who occupied a store in the neighborhood, was also malignantly and insidiously seized with fever, which terminated in black vomit and death, on the 16th July. This was the first case, I believe, in which this terrible symptom appeared.

The Epidemic had hitherto prevailed, with as much extent and mortality, in the western, as in the eastern flank of the City: But, towards the latter part of this month, and the beginning of August, it planted itself chiefly in Washington and other eastern wards. Its most prominent and fatal impression was felt there. The strongest features of the disease were exhibited there, while the ravages which had been made in Yamacraw, and the western sections, were proportionably moderated. This fact is worthy of notice; for, on examining the Register of deaths, it is perceived that, at this period, when Washington Ward became the great theatre of desolation, it was not the acquisition of a new disease, on the back of an ordinary bilious Remittent, which had occupied the western, as well as the eastern districts of the City; but an apparent concentration of effect in the eastern districts, which had been divided between eastern and western districts. The explanation of this singular transition is to be found in the character of the winds, and in the peculiar locality of these eastern departments, which will presently be rendered sufficiently obvious, by an inspection of the meteorological diagram which I have constructed. The fact, however it may be accounted for or solved, gives a correct warrant for the inference, that the cause had been divided, and

was now condensed, in conformity with the effect. It was not a mere increase of the cause, but a concentration of it in one place; and thus leads to the conclusion that it was general, and founded in some common constitution of the air and circumstances of the City. The consequences of this vicissitude, in the distribution of the morbid matter, were suitable to it. The mortality and devastation soon attracted universal notice, and appalled every man of consideration for his family or friends. The municipal authorities were specially convened to deliberate on measures for the health of the City. The Mayor addressed a letter of request to the Medical Society, for information of the grounds of the peculiar destructiveness of disease, in Washington ward and other eastern departments. A Committee of the Corporation was also appointed to make further inquiry into the same subject; and finally, a Board of Health was constituted, to ascertain means of preventing the further progress of the disease, or to mitigate it, by removing whatever might contribute to produce it. Notwithstanding every effort, however, the Epidemic continued its career in the eastern wards, until death or flight, in a few weeks, had divested them of inhabitants. Tar was burnt in the open squares, and was recommended to be burnt, also, in yards and dwellings. Every practicable mode was employed to remove the filth of streets and lots, and to extend the system of purgation. Committees of the Board of Health were organized, to make frequent and regular visits of investigation into every part of the City, and those Committees did whatever was in their power to do. Still the Epidemic rioted on, and continued to propagate death and dismay. Exertions were inefficient, because it was impossible to reach either the general or local root and source of the calamity. It gradually penetrated into all quarters of the City, except that part which is situated on the South Common, and to the westward of the new Presbyterian Church. But its greatest ravages were spread along the

streets and lanes, which were crowded with old wood houses, in a state of partial decadence, were badly ventilated, and over-tenanted with non-residents, or strangers to the climate. In such places, the scene of sickness, misery, and ruin was awful, shocking, and well fitted to inspire a melancholy sentiment of the shortness, uncertainty, and insignificance of life, and to humble all that pride and self greatness, which is incident to health, strength and pleasure.

Beyond the boundaries of the old town, there was no example of Continued fever or black vomit. The ordinary intermittent or remittent bilious fever, were the prevailing forms of disease in the country ; and they corresponded, in every way, with what might be called the *sub-cases*, or the intermittent and remittent cases which were contemporary with them in the City. There seemed to be a link of association between these, which leads strongly to the deduction, that the same species of agent constituted the foundation of all the cases which were co-existing within and without the boundaries, notwithstanding every difference of exterior appearance. The continued form of fever, and the symptom of black vomit, never passed the ancient and well settled positions of the City. In the progress of the season, that form came to predominate, and attained to such general supremacy as to constitute the common features of disease. An Epidemic was established, therefore, it may be admitted, under this shape. Was it specifically distinct from the intermittent and remittent Epidemic of the country ? Was its origin distinct, not only in degree, but chymically and in quality also ? Did they come into actual contact at the precincts of the City, without trespassing on the soil and empire of each other ; so that, while one was occupying an extensive adjacent country, the other was circumscribed and locked up within those precincts ? The country was invested, for many miles, with an unsound and epidemic state of the atmosphere. The City was encompassed with it on every side. Was there a spell

which repelled its further progress, or warded off the access which no natural obstacle could have prevented it from finding? Is it not much more probable—nay, is it not certain, that it did not only envelope the City, but penetrated also into every part of it—that it carried the same infection along with it into streets, lanes, houses, and lots, and, being unchanged, scattered its baneful effects in the same manner as it had done in the country. This was an inevitable consequence, which there was nothing to obviate. There was no barrier to the inroad of the winds, and there was no cleansing power which could wash away the unwholesome materials which they carried. Could they be present, then, and inactive? What circumstances of the City was there possible, which could have so fortified the systems of men, as to make them invulnerable to that fell agent, which was holding strong influence every where else? What power was there which could so neutralise it, as to defeat it in that way? I know of none. It was there; and that it was inert, while there, is inconceivable. It must have operated on the body with as much certainty, as we have in the operation of arsenic, under every vicissitude of place—with as much certainty as we have in the competence of a cause to produce an effect, which has been uniformly produced by it before. Whatever, then, that effect was, it was at least founded, in some degree, in the general morbid constitution of the air, which was suspended over the town and country. That constitution of air must at least have contributed largely to produce it; and, indeed, if there be any truth in the technical rules which are commonly taught, in regard to the succession of Epidemic diseases, and the exclusive sovereignty of one only at the same time, it must have acted, not only an important, but a chief part. It must have impressed its character on all cases, and must have turned to its own tendencies, whatever of impurities, from local sources, might have mingled and associated with it. It must, in fact, have formed the basis of one ge-

neral disease, more violent and destructive in certain places, according to the greater abundance of local circumstances to aggravate and promote it—more pestilential in one situation than another, in consequence of greater fruitfulness in the furnishing of those pernicious substances, or *miasmata*, which are probably the product of putrid collections or marsh fermentations. I can easily imagine a compass of twenty miles, diversified in such a way as to exhibit a pond in one place—a simple quagmire in another—a bog in another, with all the complex festerings of city filth; a fertile soil in another, without any standing waters, but rich with vegetables in decay, and dead insects; a great assemblage of rotten corn, coffee, beef, or fish, in another; an immense mass of wood, crumbling by putrefaction, in another; a great number of wooden houses, crowded upon each other, and inhabited by a species of tenantry, careless, by poverty and habit, of the foul aggregations which take place around them, in another; and then I can imagine that an Epidemic, produced by the operation of heat and humid air upon all this surface, to be identically and specifically the same, founded in the same general principle of putrid decomposition over all its parts, and diversified with various degrees of severity, according to this enumeration of circumstances. Such consequences would inevitably result from such causes. A fever, of different grades and features, but entirely of the same species, would be thus wrought into existence. An intermittent would form the general grade in one place—a remittent in another—an active continued fever in another—a fever attended with prostration of all the energies, in another—and, in another, with hæmorrhages and perverted secretions. From such a multiform origin, there could not be any unity in the symptoms or the degree, although the remote and the proximate cause might be perfectly uniform. These must be subject to change, according to the diminished or accumulated forces which produce them. And thus it happens, that

Epidemics, which unquestionably arise from the same local circumstances, assume such various types, in different seasons. At one time, as in the summer and autumn of 1817, the muscular coat of the stomach is irritable, while the internal coat indicates very little disorder: At another, as in 1819, the stomach evinces a high degree of insensibility, so as to bear, without *nausea*, the largest doses of medicine: At another, as in 1820, the internal coat is the great seat of action, while the muscular coat is comparatively passed by and untouched. What then? Shall we attribute all the varieties of summer and autumnal fever to different agents? Shall we have a new and distinct species for every year? If such a principle of dividing diseases were once admitted, the catalogue would be unbounded, and we should have as many Fall Epidemics, as there are annual periods of sickness. For, although an Epidemic has occurred in this City, since my residence in it, in connexion with every return of the warm months, I have not witnessed two which were parallel with one another, at every point. However nearly they have approximated in outward character, there has always been left some chasm in the similitude, or some inequality in the morbid excitement. But it would not merely tend to the indefinite multiplication of general diseases. By a parity of reasoning, and by pushing such a method of pathology a little further, it would become correct, and equally consistent, to divide each of those general diseases into as many minute species, as there might be different cases. For cases, during the prevalence of a general disease, are as variant from each other, in a multitude of instances, as the general diseases themselves. They are so much modified by moral and physical circumstances—by the age or progress of the epidemic season, that very often they take on peculiar dresses, and present themselves to the spectator under novel and unsettled shapes. At one point of the City, a drunkard dies of black vomit; at another, an abstemious man dies of fever,

combined with dysentery ; at another, a man of mental uneasiness dies with inflammation of the brain ; and, at another, a Painter dies with fever, united to palsy of the limbs. In the outset, the common type may be remittent ; in the middle of the season, it may become continued, with a critical duration of six days ; and, at the conclusion, that duration may be spun on to twenty days, and the skin acquire a deep yellow complexion. Thus, varieties are multiplied, according to accidents, predispositions and the epidemic power. Is it scientific to consider these cases as so many distinct diseases ? It would lead to confusion and embarrassment, without effecting one useful purpose. How, then, are Epidemics to be distinguished, and what mode is to be pursued, to ascertain the cases which do or do not belong to them ? It is evident, that symptoms and external signs are too fluctuating and mutable to be relied on. It is evident that, to receive their authority, is at once to swell the list of diseases beyond all bounds. The sagacity of the most learned is baffled by them, and practical physicians acknowledge their insufficiency, by the constant references which they make to other sources of information. The first process of the mind, in regard to an Epidemic, is to ascertain its existence ; and this is done, not so much by observing, in every case, an unvarying uniformity of shape and feature, as by observing, that many persons are seized with disease at the same time. The pneumonic fever, which prevailed in many parts of the United States a few years ago, sometimes affected the head with a *Phrenitis*, while the pneumonic system entirely escaped : and yet, such cases were ascribed to the common cause, as well as those which had given origin to its denomination. After coming, in this manner, to a knowledge of the positive prevalence of an Epidemic, the next step is, to find out its cause, not so much for the purpose of learning the philosophical nature, as of ascertaining the character of the disease which it has kindled. It is for the purpose of com-

prehending the grade and seat of the disease, by some former experience, and thus attaining to the true method of treating it. In this point of view, the cause bears no relation to exterior appearances, and an acquaintance with it cannot be considered, except with great uncertainty, as conducting to an acquaintance with them. They are to be considered as its casual and irregular products, not immediately, but mediately, through the proximate cause which it establishes. They are really the direct effects of the proximate cause, by the sympathy of parts: and nothing can be more unsystematic, than the operations of this unintelligible principle. There is a general analogy between the conformation of one body and another, which, in a considerable number of the cases of an Epidemic, tends to develope some uniform symptoms. But that analogy is not perfect enough, and, even if it were perfect, is not sufficient to counteract the accidents of pre-disposition, and the sympathies, so as to demonstrate regular appearances. Hence it seems, that the symptoms of an Epidemic are too vague and unsteady, to constitute the foundation of its pathological distinction. They are not the fixed outlines which are always exhibited, to denote and distinguish it. They have their place, and *contribute* to an understanding of the treatment of diseases. Thus far they are useful and indispensable; but to use them for the purpose of systematic arrangement, is to found an edifice on a sand-bank, which the very next wind is to scatter and carry away. When cases, then, differ in their external manifestations, it is not reasonable to conclude, that they differ in fact, and in their secret character also. When the eye is inflamed in one instance—is yellow in another—is clear in another; when the skin is at one time purple, at another deeply tinged with bile, and, at another, fair and ruddy as nature; when the stomach disgorges a black fluid at one moment—a yellow fluid at another—and no fluid whatever at another; it does not follow, that any original diversity must necessarily exist

among the morbid affections, on which they are bottomed. Where, then, are the points of specific difference between the fever of the City and that of the circumjacent country? Since the doctrine of symptoms is incapable of opening a way to a knowledge of them, what other resources have the advocates of that difference? I know of none. The epidemic causes are of less avail than the doctrine of symptoms. What are those causes in the Country? The decomposition of various substances. What are they in the City? The decomposition of substances again. The result of that decomposition we call *miasma*, which we understand only by its effects, and by its connexion with the dissolution of animal and vegetable matter, under the influence of heat and moisture. It is an undivided cause, and has more power at one time, and in one place, than another, only by its quantity and degrees of condensation. If, therefore, any weight be allowed to the cause, the unity of the Epidemic would be at once established. Notwithstanding the Intermittent of the South Common, which was the general grade and form in that place—the active Remittent at Mr. JOHN EPPINGER'S farm, five miles from town—the more prostrating Remittent at White Bluff, nine miles distant—and the Continued fever of the City; still the Epidemic would be universally the same, in regard to its real, and not its apparent character.

But it is frequently observed, that the mortality has been unprecedented in the City—that so much black vomit has never occurred before, and, in short, that the disease has no likeness to former Epidemics. These have been admitted by some, as a sufficient warrant for believing it to be new and peculiar, and unexampled. The mortality has indeed been unprecedented; but, if a pathological distinction is to be founded on different degrees of mortality, there would be no end to such distinctions; it is of all modes the most preposterous. I recollect, once, to have heard a Physician say, that an ulcer, which another had pronounced to be cancerous,

was not a cancer, because it healed, and the patient got well. A Cancer, according to his Surgery, was an Ulcer, which always ended in the destruction of the subject of it. There is much of this *cancerous* philosophy in those who found their pathological dogmas on the mere issue of cases, and not a little of it, even in those, who found them on extreme severity and forms. It is true, also, that there has been an uncommon abundance of black vomit. This symptom has prevailed more generally and extensively, in the character of the late Epidemic, than in any other which has gone before. But it is not a new symptom. Scarcely a season has passed, in which it has not made its appearance. In 1817, the number of cases was considerable, and Dr. MAXWELL, who has been an attending Surgeon at the City Hospital, has informed me, that, for thirteen years, he has constantly met with occasional occurrences of this symptom. It seems to be the highest and most inflammatory grade of the periodical fever, which requires the greatest virulence, and plenitude of the usual causes, to produce it. It seems to be an exacerbation of a mere irritation of the stomach into the state of rapid inflammation, which an increase of the causes of that irritation is fully adequate to accomplish. But, with regard to the origin of the symptom of black vomit, I shall speak more particularly, when I come to discuss the Pathology of the Epidemic. Hitherto, however, it has almost invariably happened, that cases of fever, distinguished by black vomit, have occurred among foreigners, or persons estranged from the climate. What was common Remittent in the Native, in the Stranger seemed to become Continued, and then assumed this fatal symptom. But the Remittent was nevertheless a high state of fever, and not only frequently attacked, but very often, either broke down the constitution, or was mortal. And, notwithstanding the opinions entertained by some, in regard to the unusual destruction among the native residents, by the Epidemic of 1820, it is certainly far from being

new. It is not now, surely, that we have to learn, that the periodical fevers of this City have been always fatal, in a greater or less degree, to its permanent Inhabitants ; and that, although black vomiting has not been a conspicuous accompaniment of the disease in former seasons, the devastation, from rapid and uncontrolable Remittents, was extensive and melancholy. To speak, therefore, of the novelty of the fever, in consequence of the extent of its violence, and the redundancy of one symptom, appears to me to be unreasonable, or founded in a want of more general and accurate information.

I have now arrived at that part of the subject of this Report, which relates particularly to the causes of the Epidemic, and more especially to the causes of its aggravated character in the City. In the first place, I shall describe the weather which preceded and was contemporaneous with it ;—in the second place, the peculiar circumstances of the City itself ;—and, last of all, I shall examine the reasons which have induced a few to attribute our troubles to the Dry Culture, and to importation. I hope that I shall be able to make it appear, that in these are to be found ample causes for the production of the severest grades of fever, without resorting to additional whimsical, and groundless suppositions. By referring to the Register of heat, for the month of February, it will be perceived, that, even in that month, the Thermometer rose to an extraordinary height ;—on one day, to 85 degrees ; which exceeds the medial mid-day heat for the month of August. The whole medial heat, at mid-day, was 73 degrees. In March, the weather became cooler ; but the Thermometer rose to 80 degrees at mid-day, and the medial heat, for the month, was 68 degrees. In April, the medial heat, at mid-day, was 77 degrees, and the Thermometer rose as high as 92 degrees. May was somewhat cooler than April ; but the medial heat, at mid-day, was not less than 75, and the common heat increased to 90 degrees. From this time,

the heats of Summer were established, and did not begin to abate until the approach of September. But the following Table will exhibit, in a more lucid manner, the early and premature invasion of the summer temperatures, and the gradual, though not entirely uniform, ascent of the Mercury after the month of January.

THE MEDIAL AND GREATEST COMMON HEAT, AT MID-DAY,
IN THE SHADE.

	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
MED.	73	68	77	75	81	85	82	78	67	65
COM.	85	80	92	90	92	96	90	85	85	73

From this it appears, not only that the Summer commenced in April, and converted the usual temperature of the Spring into the hot weather of that season, but that even through the months of February and March, an uncommon warmth had been infused into the climate. A Lady, who has always been in the habit of taking the cold bath in summer, informed me that she began, this year, in March, as a matter of comfort, her system of cold bathing. The whole winter, indeed, of 1819—20, was remarkably mild, and did not wear the character which was suited to it. Beside this unsalutary substitution of the genial spring, by heating suns, there were considerable falls of rain. In the course of March, April, and May, there was a deposite of nine inches of water. So that, what is denominated the *rainy season*, instead of making its entrance along with the Summer months, as it commonly does, and as it does usually in years which are only of moderate inclemency, anticipated this period for ninety days. In the two months of June and July, the quantity of rain became more abundant, and as many inches were laid as in the three preceding months. Hitherto, the rains had been divided by considerable intervals, but, on the

second of August, they sat in, and continued incessantly for twelve days, and, at the close of the month, the enormous depth of 13 inches of water had fallen. It was during this spell of twelve days rain, that the Epidemic grew so destructive in Washington Ward, and excited the public alarm. This fact is very strong, in proof of its local origin and connexion with excessive moisture. In September, there was a remission of the rains ; but, on the first of October, seven inches and a half of water, fell in a single shower ; and during the months of September, October, and November, there were fifteen inches of water deposited. Throughout the greater part of this time, the atmosphere was loaded with vapor, and was very oppressive. Notwithstanding all this long term of cloudy skies and heavy rains, there was almost a total absence of the electrical fluid. And, although I am unwilling to admit, that this fluid is possessed of any direct agency in the preservation of health, or that it operates in its general diffusion throughout the atmosphere, on the system, in any efficient or important manner, I think it exercises a useful function in sustaining the wholesome qualities of the air, by the condensation and removal of vapor. When there is much moisture, this fluid is always inconsiderable; but it is always abundant, when there is little moisture ; and when this fact is connected with the refreshing character of rains, which are accompanied with much thunder and lightning, together with the sultriness and oppressive tendency of those which are not thus characterized, it becomes probable, that they serve to assist in the formation of clouds, and to desiccate the atmosphere to a proper state for respiration. The chemistry of rain is not perfectly understood. The production and accumulation of clouds are yet to be accounted for. Is it possible for positive and negative electricities, in the first place, to give origin to vapors, from the elementary *gases*, and then to attract them into masses? I have remarked, that sometimes the rain poured in greater torrents after a se-

were flash of lightning. Whether the electrical fluid was deficient, in consequence of redundant moisture, or moisture was redundant in consequence of the deficiency of the electrical fluid, it is, at all events, a strong testimonial of the extreme dampness which pervaded the atmosphere, throughout the season. Its uncommon absence, if produced by dampness, affords the strongest confirmation of the uncommon extent of that dampness. After vapors are taken from the earth, into the atmosphere, they are either decomposed or aggregated, by a power which does not appear to be known. If, by any means, that be withdrawn, then it is obvious, that neither the decomposition nor aggregation can take place, and an excess of atmospherical moisture must ensue. It was owing, perhaps, to this circumstance, whether it arose from a sparse state of the electrical fluid or not, that a constant sense of great oppression was produced by the heaviness, and want of elasticity, in the air. Profuse exhalations were incessantly going on, and the falls of rain were considerable ; but the formation of rain did not appear to equal the exhalations, and to remove the excess of moisture which they produced. These were the general causes of the Epidemic, which were present with it, in its whole extent, over town and country. They were the common foundation of the *miasma* which engendered it. In regard to the City, however, there are many peculiar circumstances, not only because of its internal condition, but of its remarkable elevation, and exposure to the most concentrated operation of these general causes. Standing on a lofty bluff, and being entirely defenceless against the influence of extensive marshes, on every side, except a point to the south, it affords an intercepting barrier and lodgment for the abundant fogs, which are constantly raised from them. Not a wind comes—not a breeze blows from a north, east, or west direction, which is not laden with moisture, to be deposited and retained by the City. Along the channel of the River, to the east and north-east, and to the west and

north-west, for several miles, are vast rice grounds, or uncultivated morasses. Throughout a majority of the last five months, a current of wind has been daily passing over these grounds, and pouring upon us their polluted contributions; not only of pure fogs, but of fogs combined with *miasmata*—not only of simple moisture, but of moisture united with the product of a fœtid fermentation, which such a spacious bed of materials was constantly supplying, in the utmost abundance. East and north-east winds have always been found to be unwholesome; and all fatal seasons in Savannah have been distinguished by their conspicuous prevalence. They absorb, for 12 miles along the margin of the river, all the moisture which is formed, and all the poisonous *gases* which may be connected with it. In this manner, when they strike the position of the City, they are peculiarly fraught with mischief; and generate the most deleterious effects. Our oldest inhabitants have learned, from experience, and from the medical men of an earlier time, the unsalutary tendency of these winds. They are the Samoil of Savannah. The following is a table of the proportionate existence of these winds—of the proportionate quantities of rain,—calms, and electrical appearances, for seven months in the year 1818, which was the most healthy ever witnessed in this City; and the years 1819—'20, which have been among the most destructive.

FROM MAY UNTIL DECEMBER.

	<i>E. & N. E. winds.</i>	<i>Rains.</i>	<i>Calms.</i>	<i>Elec.</i>
1818 Healthy.	20	25	33	29
1819 Sickly.	25	37	34	17
1820 Very sickly.	24	40	20	5

This is an interesting Epitome of the weather, and exhibits, in a strong light, the great connexion which subsists between these natural phenomena and the degree of disease.

The difference in the winds, is not so remarkable as in the rain and electrical fluid. But there is still a difference of some magnitude ; and when the circumstances of the atmosphere are included in the calculation, it becomes very important. The quantity of moisture being very minute in 1818, the winds could not act a prominent part ; but, when that quantity was advanced so considerably as in 1819 and 1820, their influence rose immediately into the most serious consequences. They served to embank it on our heads, and particularly at frontier situations. Hence it happened, that such a peculiar and great accumulation took place in Washington Ward, and other places to the east of the town. Mr. GRAY, whose residence was in that Ward, informed me, that after having removed into the Baptist Church Square, he felt as if he had been transported to New-York. The deposite of dew in the evening, was so profuse, as to drench the cover to my gig in a short time, while engaged in visits of business there. None but medical men, who make the daily circuit of the City, appear to be thoroughly aware of this fact, and the consequent various degrees of insalubrity, which appertain to the different departments. This moisture, which steeped the air of Washington Ward in such excess, was also, in more or less extraordinary profusion, every where. The houses became damp, and articles, which were even locked in drawers or trunks, grew mouldy and rotted. It penetrated into every crevice, and private recess, however remote or protected. This untoward circumstance of extreme general moisture, was still more aggravated by the shrubbery of unpruned trees, which are thickly studded along the streets and squares. The shade which they afforded, shielded the heavy dews that fell in the night, from the dispersing power of the sun, during the day ; and, in this way, sustained a constant soaked condition of every thing that was not impenetrable to water. It will be perceived, by a reference to RAFFLE'S History of the East-Indies, that the same observation is made

in regard to large and umbrageous trees in Batavia. They are enumerated among the causes of sickness in that place, by the protection which they give to the foul vapors which are vomited up by the neighboring marshes and canals, and deposited in the City. Some defence against the influence of the sun is necessary, in a situation where it beams so intensely as it does in Savannah, during the summer. It would therefore be proper to preserve the trees, and to lop off all their great branches, so as to admit a free circulation of air. In very dry seasons, as that of 1818, their utmost luxuriance would not only be delightful, but innocent. In rainy and wet seasons, however, which are very frequent, in a latitude bordering on the torrid zone, it would, on the contrary, be obviously productive of mischief, by fostering the seeds of disease, in accordance with the fact of the present year. Such an abundant accumulation of the fogs, and *miasmata* of the swamps, within the City, from the local causes of situation, the trees, and the winds, was of itself an evil of no common extent. It was a concentration of the general epidemic composition of the atmosphere, and sufficiently calculated to produce a more violent and unmanageable grade of fever, than that which commonly prevailed. But, beside these superficial causes, of drawing together, and heaping up the product of the marshes, there seems to be an attractive power, in lofty places, over clouds and vapors, which was calculated to augment it. Baron HUMBOLDT has made this remark, in regard to the Peak of Teneriffe, without accounting for the phenomenon. There can be no doubt, however, of the existence of such a power, and of its extensive influence, in adding to the insalubrity of all such places as fall into the vicinity of low grounds. It renders them even more intolerable than the low grounds themselves. The fact is well and generally known, and this cause very well explains it. The fever of Savannah has always exhibited more severity, and malignant excitement, than that

which prevails in the country which embraces it; and so, also, does the fever, in all situations, under similar circumstances. Thus inundated with moisture, it is not a matter of surprise, that wooden houses should go into a state of decay—that even the furniture which they contained, and the filth, or offal, that was collected within or about them, should enter upon the process of putrefaction. If vegetable decomposition be a source of *miasmata*, then there cannot be a more prolific cause of disease, than the great number of old buildings of this kind. Every man who observes, must have perceived, that there is always over their surface a thick stratum, which is undergoing, or has already undergone, a dissolution. In a wet and warm season, this operation is rapid and conspicuous, and even comes under the cognizance of the smell. I think it exercises a considerable agency in the unwholesome effect of our summers. Dr. RUSH has said, that, in the yellow fever of 1793, in Philadelphia, the greatest mortality took place in wooden houses: and it is certainly very remarkable, that the newly-erected part of this City was almost exempt from the disease of the last season.— Might it not be owing, in some measure, to the more general use of brick in the construction of their houses, that the mortality of fever has been diminished in our northern cities? and might it not have been a good deal in consequence of the greater abandonment of wooden materials, that London has been exempt from the Plague since the fire of 1656? This is a subject well worthy of the serious attention of the Corporation. In addition to this great mass of vegetable decadence, in our very bosoms, there was an unusual accumulation of various pernicious matters, still more formidable perhaps. These were extremely and inordinately abundant, from the mixed, imprudent and destitute population which have flocked among us, from every part of the civilized world. Whatever could have contributed, from ignorance of the climate, from poverty or neglect, to increase and add to them,

was done. Since the conclusion of the late War, the periodical Epidemic, which has uniformly prevailed more or less, in Savannah, seems to have been augmented in the violence of its character. The poverty and distress which have arisen from the superfluous population of Europe, and particularly of the English dominions, compelled great numbers, after that period, to emigrate to the United States. That poverty, distress and emigration were still further advanced, when the general Peace took place. The first enterprises of these unfortunate Foreigners, were made at the North ; but finding that the rewards for labor were small, and that the inducements presented in the Southern Cities were stronger, they launched a second time on the sea of adventure, and came in crowds to the Southern Ports. In consequence of this great accession of strangers, without acquaintance with that kind of economy of living which is adapted to an unwholesome latitude—without money, and without conveniences—destitute of proper clothing, food, or bedding—gathering in throngs of 15 or 20, in narrow wooden buildings, with small yards—without caution, and without that considerate industry, which leads to the prompt removal of the daily products of filth, which drop from their immediate persons, a source of pestilence has been established, in addition to that which has ordinarily existed. If, in the most salubrious climes, a destructive disease has been engendered, by the concomitant circumstances of poverty, it cannot be a cause for wonder, that those circumstances, under the operation of heat and moisture, should give birth to deadly and uncontrollable fevers. I have already said, that 1817 was the most severe that had ever been experienced in Savannah, and was attended with a greater number of cases of black vomit. In the course of the summer of 1819, fifty Irish Emigrants arrived in the same ship, not one of whom survived till the frost. The year of 1820 has been tinged with a deeper and more melancholy gloom. Our older inhabitants look back, and tell us

that these are not like former times. Then, the fever was remittent, and analogous to that which now prevails out-side the bounds of the City. Then there were deaths, but recoveries were not uncommon, and cases of the continued form of fever were extremely rare. But, I say that, then, the population had not advanced in growth more rapidly than the City ; the number of the destitute and laboring had not been pressed into that narrow compass which was erected originally for convenience and a few ; then, the common labor was altogether done by the negroes, and white laborers, collected in crowds, in small houses, were unknown. Then the population was thin, resident, and composed of natives, or permanent inhabitants, whose constitutions, manners and customs, modes of living and comforts, fitted them, in the best way, to perceive the means of health, and to preserve it. All this has been changed, and every thing has been introduced which can render a spot unfriendly to the human constitution. All Cities are esteemed to be more or less unsalutary. The open and unobstructed air of the country—its freedom from the noisome collections which are incident to people congregated into crowds, is much more congenial to the soundness and vigor of the frame. This observation is an old one, and is applicable to Cities of every description, but it is more particularly applicable to those which bring their population into the smallest compass ; or to those parts of Cities, in which great numbers are forced, by poverty, into the narrowest space. The less the character of the country is preserved, and the more nearly men and residences are made to approach one another, the greater is the suffering of the system, and the more is curtailed from the term of life. All sorts of putrid matter become accumulated and incorporated with the very soil, and, instead of pure sand or earth, which may have originally constituted the surface of the ground, a species of compost is formed, and an active fermentation is taken on, whenever there is heat and moisture

enough to produce it. This state of soil is insensibly brought, in the progress of time, to contain the utmost abundance of putrifiable materials, and, of course, to engender great quantities of poisonous gas, which compact buildings and walls do not permit to be dissipated. Hence it is, that, all other circumstances being equal, large cities are more hostile to health than villages, and are found to have advanced, where their progress can be traced, from one step of insalubrity to another, until, from having been visited by moderate diseases, they become the seat of Typhus fever, Yellow fever, and the Plague, according to the climate in which they happen to be located. This progress has been very remarkable in many of the cities of the United States, and very well accounts for the violent grades of fever, to which they have been such frequent victims, in latter years. Such an event was to be expected from their growth, in a climate so subject to heavy rains and epidemic constitutions of the air. It ought not, then, to be matter of wonder, that in Savannah, there should be an augmentation of violence in the diseases which visit it, in proportion to the advancement of its population ; since it has only recently arrived to that point, which was attained some years before, by New-York, Philadelphia, and Charleston. It evinces aggrandizement and increased importance, but, at the same time, the counterbalancing evils of greater force, in disease, and more inhospitality of climate. There have been, consequently, scenes of misery, wretchedness, and filth and want, from these circumstances, in 1819—'20, which are very extraordinary notwithstanding, for a country so rich in the facilities of subsistence, and which have a parallel only in the Plagues of the old world.

There is another auxiliary cause of the disease, which belongs to the City, and is entirely recent also. The fire of January exposed to the operation of the sun and rain, a great number of vaults and cellars, which co-operated with other local impurities, and added to the insalubrity of the cli-

mate. But they have not constituted the basis of the extreme severity of the Epidemic, as some have very erroneously imagined; since the first cases of black vomit and continued fever occurred at a considerable distance from the situation of the fire, and, in some instances, among persons whose occupation and residence were seated in such manner, as to bring them very seldom within its neighborhood. The principal mortality was for some time confined to the eastern wards, so that the Mayor was, at one moment, induced to speak of the propriety of drawing a cordon around that portion of the City, and obstructing its intercourse with the rest. If the origin of the disease had been founded, even chiefly, in the consequences of the fire, it must certainly have broken out first, and most destructively, in the lots which immediately surround them. I am disposed, however, to attribute, still, some share of the morbid effect, to the vaults and cellars, and the *miasmata* which must have arisen from them; remarking, at the same time, that they did not act, and could not have acted, from their situation and condition, that very powerful part which some have ascribed to them. The Epidemic was not the result of one source merely, but of many. It arose from all the local and general sources which have been enumerated. And, when all these have been brought into view—when they are combined, and made to operate together, on one point, the effect of that operation cannot be otherwise than uncommonly efficient. When all the local sources of *miasmata*, which are somewhat new and unexperienced in this City, are joined to the usual and prolific sources afforded by the marshes which surround us—when they are joined to the general Epidemic agent, which was pervading the whole country, for many leagues, and which was poured in by the winds in such abundance—when it is considered, that the general cause was itself severe and fatal; it becomes at least probable, that a compound so deleterious, was fully competent to produce a malady, more mortal than any other of

former years. It becomes an adequate cause for the superior virulence of the Epidemic within the borders of the town, and satisfactorily accounts for it. Whether it be, or be not, an adequate cause, it is yet unquestionable, that the cause of the general disease was founded in the general atmosphere; and the cause of what appeared to be the local exacerbation of that general disease, was founded in the local atmosphere; The general affection was drawn from general circumstances, and the local affection, from a composition of general and local circumstances. Such appears to be the most probable origin of the Epidemic of 1820. But, since it has been attributed, by one class of persons, to the imperfect state of the Dry Culture—by another, to importation from the West-Indies—and, by another, to importation from the Coast of Africa, it becomes proper, not because these sources are reasonable, or much accredited by this community, to meet and refute such groundless imaginations. With regard to the Dry Culture, it is to be observed, that this system has been only partially carried into operation, and, at best, comprehends but a small portion of the swamp-lands, which, more less extend their influence to the City. I have myself, always viewed the original purchase, as the commencement of an extensive plan of redeeming from pollution, all these lands, in the course of time, and as contributing, as far as it went, to reduce the unwholesomeness of the climate. I have never been so sanguine, nor have any of the intelligent supporters of the system of Dry Culture been so visionary, as to anticipate more than an incomplete benefit from its present extent. A benefit, even such as it was calculated to procure, was, however, to be considered worth possessing, and was still more estimated, because it was contemplated, as laying the groundwork of further benefits. It is impossible for any man, who has any acquaintance with the former and present condition of these lands, to feel other than the utmost confidence in the principles of that system. If dry soils have more salubrity than

mud flats and quagmires, then it cannot be doubted, on an inspection of the grounds which have been *properly* managed, that, so far from having become more fitted to create disease, they have very much approximated to the innocuous circumstances of high situations ; and, were it practicable to insulate them, or defend them against the influence of the rice fields in their vicinity, I verily believe, that as much health might be enjoyed upon them, as on any of the cotton or corn plantations in the lower country. What is there to prevent it ? They can be as easily drained, & can be preserved as free from collections of water. In relation to their present state, the Board has been already instructed by their Inspector, whose investigations have been more minute than my own. But, so far as I have been able to inform myself, it appears, that, in some places, the ditches and canals have not been assiduously cleared of obstacles, to the afflux of water ; yet, those ditches and canals are not in a more offensive state, than the whole margin of the River, or those ditches and canals, on cultivated rice lands, where instances of black vomit are unknown. Such lands are very abundant along the coast of Georgia and South Carolina, and yet, I believe, an instance of Yellow Fever, or what is vulgarly called so, has *seldom* or *never* occurred. I was born on a Rice Plantation, and have spent a great part of my early life in the midst of the cultivation of that plant, without having on my mind the remembrance of a single instance. It seems to be totally the disease of unventilated places or Cities, conditioned very similarly to the manner in which I have represented this to have been, or operated upon by the same abstract cause. Generally, the Proprietors have not been negligent of the terms of their contracts ; and these grounds, in many places, have been beautifully managed in the culture of corn, cotton, and the grasses. If it were practicable to rescue all the adjacent swamps in the same degree, and to place them in a dry condition also, the great advantages that would re-

sult can hardly be a matter of doubt. It could not justly have been expected that a surface, chiefly tilled and carpeted in the vegetable growth of elevated places, occasionally intersected with a canal containing some stagnant water, but generally destitute of moisture as any other rich composition of earth, 150 miles in the up-country, should form an apparatus more fruitful in the furnishing of impure gases, than that same surface in its rice-field state of bog and ravine. In point of fact, it appears that the negroes inhabiting those grounds, have been so far from suffering more from disease than formerly, that they have kept better health, and acknowledge that they have enjoyed greater freedom from fever, since the cultivation of cotton has been introduced. The overseers, employed to superintend them, have sustained attacks of the ordinary Remittent, which, in some instances, have been slight, and of short duration. But there has not been an original case of that destructive grade of fever which prevailed in the City, and which has been attributed to the Dry Culture. Mr. HOWARD informs me, that there were five white men in his employ, on the plantation of Mr. WM. MEIN, not more than a few hundred yards distant, across the river, during the Fall months, who preserved their health, notwithstanding that they constantly breathed this air of the Dry Culture, in all its simplicity and strength. It is singular, likewise, that the sailors along the borders of this plantation, in the occupancy of the ships in the River, have been more exempt from fever this year than usual. Mr. BOLTON informs me, that it was even a subject of remark at New-York, in the exercise of quarantine, in regard to vessels arriving at that place, from this port. And Capt. JAYNE, of the Oglethorpe, who reached Savannah in the month of October, states, that the part of his crew which he confined to the ship, escaped the Epidemic entirely, while all perished that were permitted to come into town. This fact is irresistible, and speaks a volume in defence of that system, which it is attempted to impugn, and which is not dependant, for its soundness, on any

experiment now to be made. The Dry Culture is the only great radical mode which can be adopted, with any prospect of rendering this City a tolerable residence during the summer and autumn. Under its ancient circumstances, in conjunction with its present accession of population, its calamities will not only continue, but must be augmented. The mortality of the past season is unexampled indeed ; but when it is considered, that much arose from the mere increase of numbers, and the foreign materials of which it was composed, it does not at last surpass that of former years, so much as is imagined. Since the year 1807, there have been nearly 4000 deaths ; so that, calculating the average census at that number, for 14 years, to the close of 1820, it appears, that the whole population is exterminated at every revolution of 14 years, and that human life, according to a general computation, is contracted to that term. It is rare, in any part of the Globe, that *death* draws the tragic picture of his ravages in such strong colors. I have enquired particularly into the subject of Importation, and there does not appear to be any better reason for ascribing the disease to this source, than to the Dry Culture. Importation, as it is generally understood, means contagion ; and it would be sufficient to prove that the disease was not contagious, to establish the fact of its not having been imported. But it is more satisfactory to establish the fact, by positive testimony, obtained concerning the condition of the vessels to which it has been, or might be attributed. It was said, by some individuals, to have been brought from the coast of Africa, in a brig called the *Ramirez*, which had on board a cargo of new negroes. Unfortunately, however, for this hypothesis, the *Ramirez* did not only arrive with a healthy crew, and entire freedom from any malignant disease, but she arrived some time after the fever had grown into considerable extent and severity. I have already stated, that some rapid and insidious cases occurred in June, and that fourteen deaths took place in that month. I have stated that Mr. PATRICK STANTON, even died of black vom-

it on the 16th July. The *Ramirez* came into port on the 22d. It was not, and could not be, an African disease. From the 23d of May, to the 20th July, there came five vessels from the West-Indies, and one from New-Orleans. I have not been able to learn of any others.

On the 23d May, brig *Rover* (Capt. James,) from *Havana*.

On the 2d June, schooner *Phantom*, *Havana*.

On the 13th June, schooner *Charles*, *New-Orleans*.

On the 24th June, sloop *Darien*, *St. Domingo*.

On the 27th June, schooner *Isabella*, *Matanzas*.

July 20th, a vessel to *Green & Lippit*, from *St. Domingo*.

It appears from enquiry, as to the state of these vessels, that the crews were healthy, and that there was nothing in relation to them, which could authorise a belief of their having either severe disease on board, or the power of propagating any disease whatever. Capt. NEWELL, of the Navy, who was in the employ of the Government, during the last winter and spring, on the Island of *Ossaban*, communicates to me a very singular fact, which is worthy of notice:—He states, that he left the Island on the 22d of May; a short time previous to which, several of his crew were seized with a violent fever, one of whom died; another died on the passage to New-York, and a third after their arrival at that port;—that the first, in the course of his illness, exhibited no increase or decrease of fever, and the last was pronounced by Dr. BAYLIE, the health officer, to be affected with as strong appearances of malignancy as any case he had ever seen. These men were cut off from all communication with the main, or with shipping of any kind, until their embarkation; so that their disease was of local origin, and that local origin was a large pond, in a stagnant condition. I mention the fact in this place, in order to show the contemporaneous commencement of this fever with that of the City—their proximate characters in point of violence, and their probable alliance, through the general morbid constitution of the atmosphere. It tends to prove the locality of the disease. But

this is further confirmed by its non-contagiousness. The Board of Health, in August, by a communication to the Mayor, unanimously attested to this characteristic of the prevailing fever. I have not heard of one instance of its being communicated from one person to another. Although many have gone into the Country, and died with black vomit, there has been no further propagation of any similar affection. There have, too, been some very remarkable instances, to test the principles which are taught in the school of New-York. It is contended there, that although what is commonly denominated Yellow Fever, may not be readily communicated, in a pure atmosphere, it is so, in an impure one, or one contaminated by marshes. A country like this, is supremely calculated to try such a doctrine, because it abounds, every year, with an atmosphere contaminated precisely in this way. Accordingly, it has happened, in the late season, that several persons, after having been attacked with the disease of the City, went into the neighboring rice plantations, and died with the usual symptoms. Yet there was no evidence of contagion. A negro went from town, to the place of General RUTLEDGE, where rice is cultivated, and where it is all swamp, and died with black vomit—yet there was no contagion. Another went to the plantation of Mr. EBENEZER JACKSON, and died in the same manner, but no one took the disease. It was not contagious, then, either on this ground, or in conformity with the common principles.

The only fair way of establishing the New-York doctrine, is to prove the importation of the disease, and then to prove its propagation from the vessel in which it may have been imported. To do this, an obstacle at once presents itself, which appears to me to be almost insuperable. For it is confessed, that no propagation takes place without a certain contamination of the atmosphere: so that it becomes, at least, a matter of doubt, whether it be owing to that contamination, or to the matter of contagion. In order to fix it on the matter of contagion, it then becomes requisite to prove,

that such particular contamination is unable, alone, to produce the disease, and this can be done only by demonstrating its positive presence, sometimes, without being attended with that effect. This is impossible, in the present state of medicine, because it is not quite ascertained what the circumstances are precisely which produce it. We say it arises from *miasmata*;—by which we mean, a cause of fever, consequent on the decomposition of vegetable or animal matter, by the influence of heat and moisture. What the particular nature of the decomposition consists in—what constitutes its whole character—what are the precise materials of which it is predicated—what are the identical qualities of the agent which results from it—what quantity or diversity of this agent may be necessary, are not ascertained: And, until they are ascertained, it is impossible to determine, at all times, whether the immediate local cause be certainly present or not. But further, if it can be shown, in a single instance, that the disease has been produced without the aid of an imported *virus*, it then becomes totally impossible, by any mode of reasoning with which I am acquainted, to attach it to this source. For, if local causes produce it once, why should they not always produce it? The doctrine teaches that they must always be present, and that the *virus* is inefficient without them. They are said to go hand in hand, and step for step. Where the local causes are limited, there also is the boundary of the *virus* influence also: So that, if the effect can be attributed, for once only, to their sole agency, it becomes no longer expedient to look to contagion for additional agency. One cause which is equal to an effect, is always sufficient to account for it:—if another be associated with it, which neither increases nor decreases the effect, I do not know by what rule of logic it can be supposed to be instrumental in the production of it. It may have an influence; but I do not know how it is to be proved to exercise it. Since it is admitted to be impotent in itself—since it is said to be more virulent as the local

causes are more abundant, what means are there left to ascertain its co-operation, or to insulate it in such a manner, as to consider the part which it acts? Can it be done by tracing the gradual progress of the disease, from the imported cause? This will not avail, because the local cause may be more dense and active in that situation also, as appeared in the case of the putrid coffee in Philadelphia, and in the commencement of the violent cases of the Epidemic of this year, in the eastern wards. Even in our ordinary Fall fevers, their violence is not equally developed, in all parts of the City, at the same moment. It begins at some point, in subjection to the course of the winds, and that point has generally been those eastern wards, precisely after the manner of the last season. The New-York contagionist is thus reduced to the shift of demonstrating that the common impurities of the atmosphere are not in greater abundance at the commencing point and its neighborhood, than they are elsewhere. If he cannot do this, it is impossible for him to show the propagation of the imported *virus*. This has never been done, in any instance of which I have any knowledge. The origin of the violent cases of disease, has been commonly at wharves and docks, which are the great repository of all those local causes which are said to be necessary to the propagation.—To return, then, to our domestic sources:—They did undoubtedly produce the few cases of black vomit of 1817. The Epidemic of that year had been remittent from June till November, with the exception of a single instance, where it was continued, and attended with black ejections from the stomach. About the beginning of November, some of our Northern Inhabitants, returning from their summer tour, in the expectation that, on their arrival, the Epidemic would have come to its conclusion, unfortunately incurred the disease, which was still prevailing. In these instances, where the system was strong and inflammable, the absence of paroxysms and symptom of black vomiting made their appearance. I saw five cases of this description. They were unquestiona-

bly the common remittent, urged into the continued form, by the operation of the usual cause upon a higher state of the excitability. At this period, there was little commerce, and few vessels had arrived in port. In one of the cases, the Patient landed with indisposition, from sea-sickness, which gradually, although confined to the house, assumed this formidable shape of fever, and eventuated, after a fortnight's duration, in black vomit and death. These are instances of the local foundation of the disease, which I have witnessed personally, and am fully satisfied with. They are sufficient to establish the competency of a domestic cause, without the co-operation of a foreign one, and demonstrate the supererogation of imputing to an imported source, any share in a result which the local one is adequate to effect. I have dwelt thus on this hermaphrodite theory of Contagion, because it rests on a possibility of truth, in consequence of its inseparable alliance with the theory of domestic origin, and of the good company which it is constantly made to keep.

To sum up, then, all which I have suggested, it appears, that the causes of the fever of 1820 have been—1st. A general epidemic condition of the atmosphere, of extraordinary virulence, either proved to exist or produced, by an uncommon deficiency of the electrical fluid;—2d. The early establishment of that condition of the atmosphere, by the reduction of the winter of 1819—'20, to the temperature of spring, and the reduction of the spring to the heat of summer; thus bringing upon us, in the spring, the usual evils of summer—in the summer, a combination of those evils, with the usual evils of that season—and, in the fall, an aggregation of the evils which are usually incident to it, with this extraordinary combination of those which preceded them. 3d. The prevalence of eastern winds, which has been predominant, and uncommonly injurious, in consequence of the general abundance of moisture and *miasmata*. 4th. The growth of the City within a few years, and the rapid increase of its population; thus producing a source of internal putridity, and incorporating it

with the soil. 5th. The unnecessary luxuriance of the trees, by the shade and protection which they afford to dews and fogs, and moisture of the atmosphere after rain. 6th. The great number of small wood houses, unpainted, and in a complete state of putrescence. 7th. Uncovered vaults and cellars, the consequence of the Fire. 8th. The remarkable number of Foreigners, and persons unaccustomed to the climate, producing not an aggravation of the cause of disease, but of its general grade and character. 9th. The high position of the City, on the borders of extensive marsh grounds, thus attracting and concentrating upon itself, their products of unwholesome vapor and *miasmata*. All these causes, together, give a compound origin to the disease, which is internal and external. The origin is a tangible one, and rests on contingencies which the strength and ingenuity of man may counteract. But the task is gigantic, and can only be accomplished by public wealth, and public spirit, and public firmness. Nothing can be too expensive—no exertions can be better appropriated, than in giving salubrity to a City, which it is determined to sustain. Caprice, however heated, and liberal, and well disposed, will always lead to disappointment, if not to disgrace. It is beyond the power of the Corporation to do every thing which ought to be done, in a work of such magnitude as the total constitution of a healthy climate, in a place like this, which labors under so many disadvantages. But what can be done, should be done, and done completely, without any tergiversation. Temporary expedients are a permanent waste, and, in public as well as private transactions, lead only to discomfiture and defeat. I have pointed out the causes of the late Epidemic, which to me are obvious and plain, and in which I unqualifiedly believe. It remains for Council to select among them such as it is practicable to remove, and then they ought to remove them boldly, without being influenced in their pursuit by individual or popular notions.

Having assigned the probable causes of the Epidemic, I now enter upon a history of its character, and the modes of treatment which were employed. I have already stated that it was intermittent, remittent, and continued. The intermittent form prevailed throughout the season, but occurred most frequently in the first and latter part of it, because the *miasm* which produced the disease, was least abundant at those periods, and gave birth to a mild effect, in proportion to its quantity. The remittent form also prevailed throughout the season, but was most rife in the middle of it ; because the *miasm*, at that period, had become too concentrated for an intermittent effect, and not rife enough to produce a higher type of fever. The continued form began early ; but was not perfectly established till the last of July. It went on, then, increasing and extending, and was more and more comprehensive, until the commencement of cool weather, because the morbid cause was more and more augmented and condensed, by the incessant operation of the circumstances in which it was founded. Such was the order observed by these forms, in their relation to one another. It was a kind of order, which would probably result from a quality of the general atmosphere, arising from the concurrence of climate and decomposition, which has been recounted. In the beginning of the season, that quality being in its infancy, was consequently least powerful and fatal. In a more advanced stage, it was multiplied and strengthened, by progressive aggregations, which nothing intervened to check. From an intermittent, and mild remittent, it produced an aggravated remittent effect, almost amounting to a continued fever. At a latter date, what was adequate to engender, by its force of quantity, an intermittent or remittent, having undergone further additions, became competent to produce, and did produce, a higher type, by expunging the intervals of paroxysms, and running them into each other. The cause was increased by natural consequence, and the impression which it made was

correspondingly deeper. Ten drops of laudanum will accelerate the circulation; one hundred will tranquilize it, and two ounces will stop it altogether. This is a fair *rationale* of the origin of the worst grade of the Epidemic. There was nothing remarkable in the general traits of the intermittent type of fever. It was diurnal, tertian and quartan. Some cases, in the latter part of the fall, were severe, and terminated in death. I have a record of three, which were marked with an inflammation of the inner coat of the stomach:—A man, named LOAN, died in the Hospital, on the 3d November.—The circumstances of his case were so strongly marked, and explanatory of the disease, that I shall relate them. He had come in, on the 1st October, with a continued fever of the highest grade, which subsided under the administration of spirits of turpentine. On the 19th, he was convalescent, and walked about the house until the 28th, when he was attacked with violent quotidian ague and fever. The paroxysm, while it lasted, was as exhausting and malignant as a continued disease, and differed from it only in the complete interval which followed. He died on the sixth day, which was a very singular coincidence with the common duration of the contemporaneous continued cases. The stomach and *viscera*, after death, exhibited the same peculiar appearances as in ordinary instances of black vomit, and was undoubtedly the same disease, although no black matter had been secreted. Almost all the relapses which took place in the autumn, while the continued type of the Epidemic was predominating, assumed the intermittent form. I do not remember a single case of relapse, which was continued after the manner of the original attack. The intermittent form sometimes lost its character however, and became remittent or continued, by neglect, or bad treatment. Whether it was totally new, or only the re-establishment of a former affection, it was generally much the mildest, or least fatal, shape of the disease. For the most part, it was durable and obstinate, in proportion to its mildness;

thus making up, by time, what it wanted in force : so that, were it practicable to compress the whole morbid force of such an intermittent into a term of six days, it would probably become a genuine continued fever, and be characterized by black vomit. It seemed to be a less dangerous disease, because it was a long one. The remittent type began to be mortal in May, as has been stated. It increased in June, and produced almost every case of death for that month. It predominated in July ; but, in August, commenced to lose its rank, and to give way to the supremacy of a more deadly grade of fever. This form of disease was more destructive than the intermittent. As the number of its cases diminished, its severity was augmented : As it gave place, in number, to the higher degree of fever which succeeded, it advanced in the proportion of its victims. Its symptoms became aggravated, and the term of its critical duration was considerably contracted. I have a memorial of one instance, in which the intestinal discharges were of a dark complexion—the bile was suppressed or retained—the eyes were inflamed slightly—the neck and shoulders were of a yellowish cast, and the critical event occurred on the fifth day. This case bordered so closely on the continued disease, attended with black vomit, that but a narrow space appeared to separate them. I considered cases, thus extremely wrought up, as the last grade of a complete remittent. But, in many instances, it extended a step farther, by constituting the first part of the continued disease. For two or three days, the paroxysms were distinct enough, and then ceased altogether ; thus forming an attack half remittent, half continued. There was nothing remarkable, however, in the general features of this remittent. It was, for the most part, very analagous to the Epidemic of other years, in many of its symptoms, and was not peculiar in point of violence. I have repeatedly seen a degree of fever in October, such as this, and there was something novel, perhaps, in the period of its occurrence. It was out of its ordi-

nary place: A chill, of more or less duration, established the disease, in nine times out of ten. This chill alternated with heat and thirst, sometimes continued for several hours to harass the patient, and finally gave way to a hot fit, which was marked by a general diffusion of the blood, and a mitigation of the uneasiness. The body of the disease appeared to be constituted by the chill, while the heat and activity of the pulse, which superceded, appeared to characterise its abatement. Such a chill, in connexion with a hot fit, and then followed by a remission, formed a paroxysm which was repeated, according to the tertian type sometimes—sometimes according to the quotidian, and, at other times, according to the double tertian. The common critical duration was about a fortnight: but it was, occasionally, both longer and shorter. I might make the same observation, in regard to the force of the remittent cases, which has been made in relation to that of the intermittent. If it were practicable to compress it within a term of five or six days, it would probably produce a continued fever and black vomit; for, constantly, the force of the disease is in ratio with its critical duration. I cannot pass by this short notice of the remittent type, without mentioning a very characteristic feature, which accompanied the majority of serious cases. It was the complete suppression of the bile after a few days; so that purgatives expelled nothing but a transparent fluid, void of all smell. It was a certain sign of a dangerous grade of the disease. What denomination shall be given to cases of this description? They cannot properly be called *bilious remittent*, since they are not bilious at all;—they cannot be called *yellow fever*, according to the general idea, because, often, the skin does not become yellow, and there is nothing which can be called *malignant*, although they are severe, and frequently fatal. I leave the difficulty to be got rid of by better nomenclaturists than I am. It gives me a surety, however, that the fever which is commonly denominated bilious, does not arise from bile; and

that the quantity of this substance is an accident, which constitutes no part of the essential nature of the disease. The continued form of the Epidemic took place rarely at first, as I have said ; more, in all probability, from the great excitability of the constitutions in which it appeared, than from the power of the poison. It took place in at least three-fourths of the cases that occurred in October, or at last ; and evidently depended more on the virulence of the poison, than greater liability of constitution. It was generally preceded by a premonitory disorder, for one, two, or three days, in the shape of sick stomach, want of appetite, pain in the head or giddiness, or burning in the stomach. I knew a case, in which this burning in the stomach was the first symptom of the approaching disease : It took place for twenty-four hours before the fever or excitement of the blood vessels occurred ; and tends, with other facts, to prove that such excitement was symptomatic, and founded in a local affection of the stomach. The disease commonly established itself with a chill, which was followed by a hot fit of two or three days' continuance, with a turbulent action of the arterial system, and a general agitation of the whole body. At the end of this period, the tumultuary appearances subsided, and the Patient sunk into a tranquil state. All exterior exhibitions of disease vanished, the pulse became regular, the countenance good, the tongue natural, the thirst went off, the strength of the muscles returned, the mind was clear and sound, and altogether the Patient was quite well, except a burning and extreme soreness at the *epigastrium*. An intelligent man in this situation, told me that he felt so well, but for weakness and this sensation of the stomach, that he could not help conceiving it possible for him to recover, although he was throwing up black matter occasionally. This tranquil stage continued about two days, and death seemed to steal gradually into the system, by slowly diminishing the force of the heart and arteries, and obliterating the pulse step by step,

from the extreme vessels to the great trunks. The total seat of the disease, during the latter period, was fixed in the stomach; and had it been practicable to make that healthy, the recovery would have been completely effected. It was obvious that the death of the Patient did not arise from fever, but from inflammation of the stomach, or *Gastritis*. This affection was constant and almost invariable in its occurrence. While others were fluctuating, or accidental; this was almost universal. Sometimes the eyes were affected with yellowness or inflammation, or *strabismus*, or total loss of vision; sometimes the skin was marked, through its whole extent, with bile, or *petechiæ*, or blotches, or purple discolorations, or irregular sweats; sometimes the neck and shoulders were suffused with a dingy yellow, resulting from the stagnation of *serum*; sometimes the cheeks and lips, in women particularly, were flushed with a beautiful glow; sometimes there was complete deafness; sometimes there was extreme and unquenchable thirst; sometimes the tongue was covered with a long or short fur—was very red around its edges, or natural and clean, and moist; sometimes the muscles were strong, or feeble, or palsied, or convulsed, or so painful as to render the weight of the bed-clothes intolerable; sometimes the mind was affected with stupor, delirium, or fury; or loss of memory in general, or for particulars, with a soundness of all the other faculties, and sometimes with an apathy to every thing, so as to look on death, not only with indifference, but even with cheerfulness; sometimes hæmorrhages took place from the nose, gums, kidneys, stomach and intestines, ears, uterus, from wounds, and from blisters; sometimes the parotid glands were inflamed and suppurated; sometimes the respiration was laborious and asthmatic; sometimes the pulse was rapid and tumultuous, or slow to excess, even much below natural; sometimes there was pain in the loins and head, and a general soreness throughout the body; sometimes there was pain and palpitation of the heart; sometimes the Patient was distressed

beyond expression, or was easy, and even comfortable, in the utmost violence of the disease ; sometimes there were chills, even through the whole attack, or there were none at all ; sometimes the attack was divided into the tempestuous and calm stages, which I have mentioned, but often there were distinct paroxysms in the beginning, or there was but one stage of violent symptoms, from first to last ; sometimes the pulse, pain, vomiting, and heat, were harrassing to the close ; sometimes the external temperature was moderate, while the internal was excessive ; sometimes there was hiccup, or irritation of the Diaphragm ; sometimes there was vomiting, without permitting the Patient to rest for a moment, while very frequently there was either no vomiting at all, or it occurred very seldom ; sometimes the excretions were scanty or abundant, and variously characterised, the *fæces* being liquid and inodorous, or dark, thick, and fœtid, or bilious—the urine being transparent, or turbid, and red ; sometimes there was an universal sensation of numbness, such as might arise from inactivity of the nerves, or there was a deficiency of the common nervous irritability, or constitutional perception of customary impressions. The effects of the disease, upon the different parts of the body, as evinced by these symptoms, were irregular and uncertain, occurring without observing any particular order or arrangement. They seemed to be developed by accident, according to constitution and predisposition. I have remarked, that a case, produced by a debauch of ardent spirits, was most apt to be attended with black vomiting—that a case occurring in a Painter, assumed a palsied state of the muscles, and another, in one disposed to dysentery, took on the garb of that disease. Affections of the head, lungs, liver, kidneys, nerves, muscles, glands, skin, blood-vessels, &c. &c. were as inconstant as it was possible for them to be, and were unquestionably to be considered as merely casual, and not essential, parts of the disease—as the result of sympathy with some primary affection. This

opinion is further confirmed, by examination after death. On opening and inspecting about sixty bodies, it appeared that, generally, the brain was free from morbid traces of any kind; but, in some instances, where there had been stupor, or furiousness, or dilatation of the pupils of the eyes, or *strabismus*, with loss of vision, the blood vessels were found engorged with blood, and water was deposited in the ventricles;—that the lungs were sometimes distended with blood, and inflamed, but commonly perfectly natural in their texture and aspect;—that the liver was of many colors, sometimes injected with much blood, and sometimes was dry, sometimes tinged with an appearance of bile, and very often without any such appearance; commonly the biliary duct contained a small quantity of fresh bile, when there were no evidences of its presence in the intestines. It appeared that the gall-bladder was sometimes inflamed in the cellular substance which forms its bed, and over its internal coat, while, in such cases, it never contained cystic bile, but, instead of that, a small portion of a tasteless, yellowish fluid, something like *serum*. In the majority of cases, however, it was filled with very thick dark, green, or brown bile, and exhibited no inflammation:—it appeared that the kidneys, when there had been great pain in the small of the back, were occasionally engorged with blood, and inflamed over the surface of their *pelvis*, or presented, on the outside of this membrane, collections of extravasation; but, generally, were sound, and free from all vestiges of disease:—that the whole Peritoneal membrane was, in some instances, inflamed, but was, for the most part, healthy and natural:—that the spleen was sometimes enlarged, filled with a dark thick blood, and so rotten in its texture, as to tear very easily in extricating it from its attachments. All these morbid appearances were accidental, and adventitiously connected with the main disease; for, had they been idiopathic, or primary, and not secondary affections, they must at least have taken place

more generally, if not uniformly. The stomach seemed to have been the constant, and perhaps universal, seat of the disease. Of the whole number of subjects dissected, there were but two instances in which this *viscus* was not inflamed. In these exceptions, it is probable that inflammation had existed, and been removed by the effusion of black matter, which had been vomited thirty-six hours antecedently. The morbid effect was generally confined to the internal coat, in the latter part of the disease : in the beginning, the muscular coat felt it in some degree, as appeared by the more frequent vomiting. That is, while the disease was in its incipient stage, or stage of irritation, before the establishment of inflammation, that coat seemed to be subject to its influence. At no period however, in general, was the disposition to vomit very great. It was much greater in the remittent type, and, I think, it has commonly been a more prominent symptom in former Epidemics, of less severity. As the soreness of the *epigastrium* increased to the touch, that is, as the inflammation of the inner coat was augmented, and confirmed, the affection of the muscular coat, or disposition to vomit, diminished. I have often found the stomach in the highest state of inflammation, and sometimes filled with the matter of black vomit, when there had been very little vomiting, or none at all. Irritation appears to dispose much more to this effect, than actual inflammation, and most likely constitutes the excitement of ordinary fall fever, in which the vomiting is the most troublesome symptom. The inner coat of the stomach was inflamed in different degrees over its whole extent, but was always more inflamed about the orifices, than elsewhere. The appearance was sometimes spotted, but much more frequently diffused by an uniform injection of red blood into the exhalents. In one instance only, an ulceration took place. There was no instance of gangrene. The inflammation ran highest in the robust and strong, as in healthy Foreigners. In these, the vessels were so rapidly distended, as to burst,

and then the stomach was found to be full of pure blood. Commonly, however, it contained a light brown, a deep brown, or black matter, with a peculiar kind of *floculi*, which has been often described. This substance was inodorous, almost tasteless, and soiled paper with a dirty color. It was not bile, for, in many instances, it was found in considerable quantity in the stomach, while the *duodenum* contained very little, the *ductus communis* contained yellow bile, the gall bladder such bile as has been described, and which always imparted to paper a yellow color. It was impossible for this matter to have come from the liver, without leaving some traces in the gall bladder, gall ducts, or *duodenum*. Before it could have made its way to the stomach, the *duodenum*, at least, must have been filled to overflowing. It was not blood, although that idea is advocated by men of ample opportunities to understand the subject. Dr. NICHOLAS CHERVIN, an ingenious and intelligent French physician, who visited this City during the prevalence of the Epidemic, for the purpose of adding still more to a long experience in yellow fever, firmly entertained this opinion. I confess, however, that his proofs did not appear to me, to be perfectly satisfactory. They consisted in the gradual darkening in color, of the blood which was found, in some cases, in the intestinal cavities, according to its degrees of distance from the stomach; and the analogy of taste, between this blood and the matter of black vomit. He took a subject, which was calculated in the best manner for his purpose. A strong English sailor had sunk under the most boisterous and deadly symptoms of the disease. He had been my patient, and I knew the circumstances of his case. At the dissection, the stomach was found to be completely inflamed over its whole surface. The blood-vessels were uncommonly distended with red blood, and the cavity was filled with blood not yet coagulated. The *duodenum* contained blood already coagulated, and of a darker hue; in the *jejunum* it

was still darker, and in the *ileon* still darker than in the *jejunum*. At the lower part of the ~~jejunum~~ there was, for the extent of six inches, a mass of genuine black matter; the *colon* was filled with red blood. All the matter between the *cæcum* and stomach, had evidently originated in the stomach, and, at the first blush, seemed to correspond to the design of the demonstration. But an explanation of the case clears up the difficulty, and accounts in a different way for the facts of this dissection. The patient was an athletic man, and as inflammable as the highest health could make him. On the second day after the attack, he vomited a considerable quantity of black matter, (and not blood,) at one or two ejections. After this, he constantly vomited red blood, until his death, which took place on the third day. In the examination, whatever was blood, however dark to the eye, always produced a red complexion on paper, and the small mass near to the *cæcum*, which imparted the black color, was but a portion of that quantity of black matter, which was in part thrown up in the first instance, and which had been pressed down to that portion of the intestinal tube, by the succeeding hæmorrhages. If the matter of black vomit were blood, changed by the operation of the stomach upon it, after it bursts from the vessels into the cavity of that organ, then, in this case, the reverse of what took place, in the case here recited, ought to have occurred. The first ejections must have been constituted of blood, in its fresh state, from the vessels; and the after ejections of a darker hue, by the longer influence of the stomach. In some instances where hæmorrhages took place from the beginning, without any preceding ejection of black matter, no such ejection ever took place afterward in the course of the disease, and nothing but blood appeared in the abdominal cavities, after dissection. On the other hand, when black matter was thrown up, from the outset to the close, blood was never found in the stomach after death. If the black matter had been blood at any moment, it is surely probable that it

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would frequently have been thrown up, mingled with that fluid, in a greater or less degree. But I cannot conceive that any process of the stomach should have such an effect on blood. It might digest or dilute it with discharges from the exhalent vessels; but why it should convert it to a black matter, I am not able to understand. The matter, such as it is found in the stomach, appears to be deposited therein that shape. The small vessels of the inner coat, which, in their natural state, contain *serum*, are found distended with red blood, and it is probable, that, having undergone a transformation, it is thrown out by them, in the form of the matter of black vomit. When the vessels are rapidly distended, and time has not been allowed for this transformation, actual hæmorrhage takes place, by the rupture of their coats. It is on this account that, when such an event occurs, the black matter seldom makes its appearance afterward. The vessels are emptied, and the inflammatory excitement, with which the transmutation of the blood was connected, becomes reduced, or is completely resolved. A similar issue, on the other hand, arises from the effusion of black matter. The vessels are evacuated, and the distention is so much reduced, the inflammation so much lessened, that it very seldom happens that hæmorrhage succeeds it. These conclusions of the inflammatory action appear to be always distinct, and never contemporary. They do not mingle at any time, as far as I have been able to ascertain, and seldom occur, at different moments, in the same patient. Yet, it is possible for them, perhaps, to mingle and occur together, though they are evidently so often separated, as to prove that they are different things. After much black vomit had been thrown off, the burning in the stomach was generally ameliorated, and, in such cases, it was always found, that the appearances of inflammation were much less strongly wrought, than in those where the patient had died rapidly, and the black matter had been ejected in small quantity. In some cases,

where the vomiting had been considerable and long, the inflammation was either moderated by it, or was completely removed, as in two cases which have been already mentioned. The inflammation of the stomach sometimes extended in patches along the *jejunum* and *ileon*; commonly, however, these intestines were quite free from disease. The *colon* was more often affected, and appeared to be as much subject to hæmorrhage as the stomach; but, I have no distinct testimony of its having been, in any instance, the source of a black matter, similar to that of the stomach. The inflammation frequently passed beyond the orifice of the *cardia* up to the throat, producing a sense of soreness, and a voice like that arising from a slight degree of quinsy. In such cases, the membrane of the mouth and *pharynx* was obviously irritated, and participated in the morbid condition of the parts beneath. In a few instances, a black matter was produced on the superior surface of the tongue, which extended as far down into the throat as could be seen. I am not able to say, positively, that it extended all along the channel of the *æso-phagus*; for I had not an opportunity of dissecting such a case; but it most probably did so. This matter was such as was found in the stomach, in cases of black vomit, and could be taken off with the nail, in sufficient quantities to be examined. It did not come from the stomach, as might be imagined, because it occurred in cases without any attendant vomiting: Nor was it similar to that blackness which takes place in low states of fever. Dr. KOLLOCK, to whom I exhibited this phenomenon, was induced to adopt the same opinion with myself. Where the surface of the stomach was in a high state of inflammation, the natural deposit of *mucus* was not to be perceived. In those cases, in which the inflammation was lessened by the effusion of black matter, it was considerable, and, in the two cases where the inflammation had been entirely resolved, the quantity was very great—much more than natural. The body of the disease appeared to be

fixed in that inner membrane which lines the whole passage from the lips to the *rectum* ; but more particularly of the stomach and *colon*, and most particularly of the stomach. It was marked by excessive irritation, and thirst, and hæmorrhage in the mouth—by inflammation of the throat and *æso-phagus*—by excessive and constant inflammation of the stomach—by patches of inflammation in the small intestines—and frequent inflammation and hæmorrhage of the *colon*.—Here was the seat and throne of the morbid excitement.—Whatever was the diversity of external signs and symptoms—however unsteady and delusive were affections of skin, countenance, head, chest, pulse—or however irregular the traces of disease by dissection, in other parts of the system, here there was no variance. The stomach, and often other parts of the internal surface, had been, or was always inflamed. It was a local and idiopathic disease of these internal membranes, such as would be produced by a poison which had been swallowed. The proofs briefly consist in the premonitions of burning in the stomach, loss of appetite, indigestion, costiveness and nausea—in the excruciating heat, burning and pain of the stomach, generally steady, but rarely periodical, in the first stage of the disease—in the total absence of fever and all other affections, very often, particularly in the darkest period of the season, during the latter days of an attack. For two days in fatal cases, and for one week, in a few cases of recovery, I have seen not one semblance of morbid action in any part of the body, except the stomach, and perhaps some other portions of the interior passages. Could such a state of the constitution be called a fever? Can that be fever which is not attended with the slightest commotion of the general circulation ; in which the tongue, temperature, countenance and mind are in their natural condition? In cases of this nature, it was evident that the canker was entirely topical, and that when death occurred, it was owing to the destruction of vital power in a part, and the loss of an essential influence to the rest of the

system. The patient himself would say—were it not for the sensations in the stomach, he would be quite well. And it was obvious that the unsoundness of this *viscus*, was the only radical cause of complaint. A disease of general morbid excitement would continue to be general till its conclusion. The *lesion* which had produced it, would be general, and there would, of course, be general corresponding morbid action, which would no more cease in one part than another. If all the blood-vessels were affected with such an excitement, as was produced in the stomach by this disease, it is probable that they would, to the termination, retain some degree of it, or that they would exhibit some vestiges of it after death. But this, in a vast number of instances, did not take place. For a considerable time before death, all exterior ailment vanished—and the muscular strength was yet far from exhausted. The pulse became at first natural, and then gradually weaker and slower, retreating step by step, without any spasmodic jerk, towards the heart; and the patient expired as easily as if he had been bled to death. Whatever agitations of the general system took place in the beginning, or whatever other local affections were produced, it is to be presumed, that they were the results of sympathy and predisposition—that they were symptomatic and secondary, and bottomed upon a primary injury in another place. Such is the intimate connexion of the stomach to every part of the body, that nothing transpires there, which is not felt more or less every where. Diuretic substances instantly operate on the kidneys—sudorific substances instantly affect the skin—narcotic substances instantly affect the head—antispasmodic substances instantly affect the nerves—pure stimulants promptly accelerate the arterial actions; and so on, are various effects on the stomach responded to by distant organs. If its power be decreased, all other parts languish;—if it be increased, all are invigorated. So great is its importance, that some have supposed, not very unreasonably, that it possessed

the principle of life, and was the tabernacle of the soul. It is not, then, to be wondered at, that a high inflammatory action, in a part of such dignified and extensive influence, should give rise to the most serious consequences. A mere *phlegmon* among the muscles will frequently give rise to a symptomatic fever of the highest grade, and sometimes evenuates in a hectic disease, and death. If inflammations, in parts so unessential, have such importance to the whole constitution, how much more signal and profound must be their operation, in parts which are vital. An inflammatory excitement in the vessels of the stomach, from mechanical or chymical injury, would uniformly disorder or disease, in a greater or less degree, every part of the body. It would, from the different arrangement of the sympathies and predispositions of distant parts, in respect to the stomach, create in them various commotions and morbid actions, in unison with that diversity of arrangement. It is well understood that, in different individuals, there is an indefinite variety in this association of parts to the stomach. It is well known, that the greatest uncertainty is attached to the effects of medicine, in consequence of it; that two substances, which produce dissimilar operations in one person, may produce similar operations in different persons. These are principles which all recognize, and are explanatory of the external fluctuations which were exhibited by the disease which I have been describing. Such fluctuations, and their connexion with an uniform affection of the stomach, are to be accounted for in no other way, so well as by the doctrine of sympathy. With this clue, every irregularity of sign and symptom is illustrated and explained. In proportion to the various powers of the stomach, over the different organs and parts of the system, are these organs and parts implicated by the unsound condition of that *viscus*. And when it has ceased to exercise any of these powers, as in the latter days of an attack, it is evident, that they have ceased to exist, and that

such relationships have been broken off, by the inability of the stomach to sustain them. When its morbid excitements are no longer diffused and extended beyond itself—when other parts which have felt them, as the brain in delirium, the muscles in excessive weakness, and the arteries in a state of spasm, become restored to their natural condition, it is clear that its constitutional influence has been withdrawn, by the ravages which it has undergone. It is clear, that such restoration has been produced by that withdrawal, from its accession, in correspondence with the aggravation of disease in the stomach. I have repeatedly seen, the external symptoms mitigated at the approach of black vomit, and their disappearance after its actual occurrence. It is curious to observe the similarity of effect, to this disease, which is produced by arsenic, when taken into the stomach. In that case, this organ is primarily assailed, and the irritation and inflammation which it undergoes are unquestionably, I think, the origin of all the consequent events, which are to be considered as secondary and sympathetic. The symptoms of poisoning by arsenous acid, are thus to be enumerated: “An astringent taste, fœtid mouth, frequent ptyalism, continual spitting, constriction of the *pharynx* and *œsophagus*, the teeth set an edge, hiccup, nausea, vomiting of a matter, sometimes brown, or black, sometimes bloody; anxiety, frequent faintings, heat of the *præcordia*, inflammation of the lips, tongue, palate, throat, eyes and *œsophagus*; the stomach painful to such a degree, as not to be able to support the most emollient drink; the *alvine* discharges blackish, and of a horrible fœtor; the pulse small, frequent, concentrated, and irregular; sometimes slow and unequal; palpitation of the heart, syncope, unquenchable thirst, pungent heat all over the body, sensation as of a devouring fire; sometimes an icy coldness; breathing difficult; cold sweats; urine scanty, red, and bloody; change of the features of the countenance; a livid circle round the eyelids; swelling and itch-

ing over the whole body, which is covered with livid spots, and sometimes with a miliary eruption; prostration of strength, loss of feeling, particularly in the feet and hands; delirium, convulsions, often accompanied with an insupportable *priapism*, falling off of the hair, detachment of the *epidermis*; and lastly, death. It is rare to see all these symptoms united in the same person; sometimes almost all of them are wanting." This is almost a history of the Epidemic of 1820, in a considerable number of its examples.

Such appears to be the pathology of the disease—an irritation or inflammation of the membranes which line the inner passages, and particularly of the stomach—a *gastritis*—with various and irregular sympathetic affections, produced either indirectly, or by the direct contact of a gaseous poison. This poison appears to be a positive agent, and arises from heat, moisture, and dead matter. The immediate presence of heat and moisture, does not appear to be necessary to the production of the disease. They are necessary to the generation of the poison, which will continue to produce the disease long after the diminution of heat and moisture, to the common standard, or even below it. These conclusions are drawn from the facts of 1820—but, the remark may be made every autumn in this City, that the immediate presence of heat and moisture, is not indispensable to the prevalence of fever.—When the rains have long been reduced, and the summer temperatures have been greatly diminished in the month of September, so far from receding, it generally happens, that our Epidemics advance, and become more destructive. Sometimes the greatest mortality takes place in the finest and most congenial weather. Yet, it is as certain, as almost any thing else, that heat and moisture are necessary, and must constitute a previous basis for their invasion. Our sickly seasons are commonly characterised by considerable and constant falls of rain in July and August, and afterwards by spells of serene, dry weather, mingled with occasional hard

showers. As the Epidemic sets in always, as soon as a few hot suns can operate on the moisture which they produce, and continues to be more and more aggravated after they remit, it appears probable that a poison is engendered by them—that such poison is constantly accumulated, and made more abundant as the season progresses, by the elaboration which follows every shower, until cold and frost come and neutralize it. In cities, it must be more rapidly and densely collected, than in the country; and in all confined places, it must become more deadly, than in such as are airy. Being thus pent up, it appears to be augmented as long as the circumstances of fermentation exist—ceases to be augmented, whenever they cease—but does not become inert by any means, as far as is well ascertained, except the influence of winter. The liability to become affected by this poison, appears to depend on two principles—a constitutional fitness to receive its influence, by a want of that natural, or acquired structure, which is adapted to it, and a high state of excitability, as is connected with robust and healthy bodies, which, nevertheless, are not very hardy. The first principle was exemplified, not only by the great mortality among strangers and non-residents, but by their greater susceptibility to disease. Even when the event was fatal, in both stranger and native, the symptoms were more violent, and the critical term much shorter, generally, in the former. It was owing to the natural possession of this fitness, perhaps, that mulattoes were more exempt than whites, and negroes more exempt than mulattoes. The darker the complexion, even among whites, the greater appeared to be the probabilities, not only of escape, but of recovery. The seventy new negroes, that were employed by the Corporation, seemed to be invulnerable, and, I believe, were more healthy as the season was more destructive to the white inhabitants. The country-born negroes were sickly; but, in general, their cases were mild, and easily controuled. A con-

siderable number died, however, and there were some very strong instances of black vomit among them. The second principle was exemplified, in the ravages which took place among the young men, of high health and vigor, between the ages of twenty and thirty, and those persons who debauched irregularly with ardent spirits. Regular drunkards were exempt in an astonishing degree. Men were more subject to the disease than women, and adults more than children. There were some cases of black vomit among children, but the number was comparatively very small; since I myself did not witness one. Their fevers were commonly governed without difficulty. After the age of thirty-five, the system did not appear to be so readily affected, although I saw, among the very old and infirm, some cases of the highest and most mortal character. In order to elucidate the difference of effect on a native and foreigner, I extract from my note-book, the journal of two cases which terminated mortally, though attended with very different degrees of violence:

Sept. 13th. NATIVE—Seized in the night with chill and fever, pain in head and back, moderate thirst and heat, clean tongue, pulse soft and frequent, considerable ejections of bile, sweat and remission.

19th. Exacerbation, heat increased, quick tense pulse, thirst, furred tongue, pain in head and back, dry skin.

20th. Indistinct remission with moisture, tongue clean, thirst great, restless, pulse reduced, soreness along the edges of the ribs, sighing.

21st. Tongue dry, thirst great, dry skin, pulse still reduced, heat natural to the touch.

22d. Tongue moist, clean, parboiled; vertigo, moderate heat and thirst, pulse small and frequent, skin dry, momentary moisture, delirium, loquacity, restlessness.

23d. Great weakness, tongue same, pulse same, great oppression of stomach, and sighing, moderate heat, and thirst, watery passages.

24th. Internal heat, pulse small weak and frequent, tongue brownish and dry, cold extremities, great thirst, great oppression, sighing and restlessness, breathing sometimes laborious, perspiration about the body, sore throat, passages dark green, incessant frown, very refractory, delirium, sighing more frequent, pulse extinct, and death. This was a case of seven whole days, and not entirely continued—one clear paroxysm and remission—one chill—discharges of bile and not black matter.

Sept. 18th, 8 o'clock, A. M.—HEALTHY FOREIGNER—Attacked without chill, pain in head, flushed cheeks and eyes, white tongue, pulse frequent soft and full, syncope after bleeding 12 oz. 6 o'clock, P. M.—Pulse moderated, great thirst, less flushing of cheeks and eyes, pain in head, tongue white, heat great, black stools, fever abated.

19th. 8 o'clock, A. M.—Heat moderate, great thirst, pain in head, tongue the same, eyes red, cheeks flushed, dry skin, great soreness in stomach, cannot bear it to be touched, pulse moderate, full and frequent, somewhat tense. 6 o'clock, P. M.—Vomited black matter at 2 o'clock, red eyes, tongue same, thirst same, head-ache less, dry skin, moderate temperature, soreness along the throat and *æsophagus*, general restlessness, pulse sinking.

20th. 8 o'clock, A. M.—Pulse almost extinct, circulation in extreme vessels stagnated, yellow tinge in the neck and shoulders, eyes red and yellow, heat moderated, tongue white, stools and vomiting black, darting pains in stomach in lying on the sides, no other pain, feels much better.—6 o'clock, P. M.—Burning and pain in stomach, tongue white, thirst great, extremities cold, mind good, vomited great quantities of black matter, pulse scarcely perceptible, skin dry, sense of heat moderate, restless.

21st.—Dead. This was a case of three whole days' duration, and of two stages; the first tumultuary, and the latter passive, or characterised by the total absence of fever. I

have thus drawn a picture of two cases, which correspond very well with my design, though the difference between the effects of the Epidemic on the Native and Foreigner, was generally much more strongly marked. About one-fifth of the mortality took place among the natives of Georgia. Probably not more than one-tenth among the natives of the City. There can scarcely be any better evidence of the local origin of the disease, and of its foundation in the climate, and circumstances of situation. In the treatment of a disease, so much diversified as I have represented this to have been, it is at once to be perceived, that no one remedy could apply universally. Yet, it appears evidently to have been, either an inflammatory disease, or a disease of irritation in the arteries of the stomach, producing distant local affections by sympathy; and it would be inferred, apart from experience, that none but remedies which belong to the class of *antiphlogistica*, could be proper. Such, however, was the result of experience, in addition to the conclusions of principle. Stimulant substances, excepting in cases of extreme individual occurrence, were always found to be hurtful or aggravating. They promoted the violent process of the disease, without doing any radical benefit. It has been imagined by some, who believe in an *crysepilatous* affection of the inner coat of the stomach, by an *introversion* of the disease, that it is in the power of stimulant medicines to produce a reversion, by driving it back into the general system, or to sustain it in the system at large, before it has undergone that introversion. If this theory were founded in truth, then it is very probable, that such a plan of cure would succeed, as in cases of sunken eruptions of the skin sometimes. But the disease does not appear to be a secondary, but a primary, and of course a legitimate, affection of the inner coat. To attempt to repel it from that part by force, is an attempt to drive it from its natural position, and is as unavailing, as would be an effort to transpose a Pleurisy, by stimulating

and heating medicines. It is adding more obstacles to the proper method of treatment, which consists in diminishing the morbid excitement, by subtracting from it, or inducing, not repelling it, into a less vital part. Such was the consequence of administering bark, camphor, pepper, brandy and wine, laudanum, mosch, sugar of lead, snake-root, turpentine, and articles of this nature. I think I have often seen them increase the calamities of the patient. Remedies of this character sometimes deceive, by quieting the distress and agony of the disease for a time, as they do in other acute inflammations ; but the temporary effect being worn off, they always leave things worse than before. Such is the violence and inevitable fatality of a disease sometimes, that medical men become restless and embarrassed in the employment of the regular and scholastic means of contending with it ; and are not only disposed, but are warranted, in canvassing for something new and better. In such circumstances, stimulant substances are generally resorted to, either with or without a theory ; either for the purpose of revolutionising the condition of the system by force, or of curing the malady by some specific or unknown process. From a state of things like this, I was induced, during the last season, to try some of these medicines which I have enumerated ; but always found myself either defeated or discouraged in the event. In consequence of the recommendations and reported success of the oil of turpentine in Philadelphia, and sugar of lead in Charleston, I permitted myself to use them very sufficiently in the Hospital, to ascertain that they are either injurious or doubtful remedies. I employed the sugar of lead both before and after the occurrence of black vomit, without the least apparent benefit. I employed it for the purpose of allaying irritability and vomiting, but, so far from producing such effect, it either did not controul them, or aggravated them. I conceived it might palsy the powers of the stomach, and afford an opportunity, at least, for the administration of curative reme-

dies, in cases where that organ was too excitable to bear them;—but so far from quieting, it increased its disturbance very often, immediately after it was swallowed. It irritated the stomach, instead of palsyng it, and did as much harm, and in the same way, as it does in extremely acute inflammations of the eyes. I think I may safely say, that it never did good, and that it many times did injury. In relation to the spirits or oil of turpentine, my mind is not so entirely made up. There may be a weak stage of the disease, in which it might be applicable. I have a record of 41 cases, 29 of which are marked as fair for the administration of remedies; the remainder as desperate, and too much advanced to derive good from any means whatever. Of all this number, eight only recovered under the use of turpentine. In two or three most violent and malignant instances, it really appeared to me, to save the life of the patient; at all events, the *cure was accomplished*.

—DR. KOLLOCK, who inspected the progress of these cases, and rarely employed the medicine himself, was induced to decide positively against it; and I am sure that, in similar circumstances, I shall never administer it again. Perhaps the oil of turpentine might prove more successful than the spirit, which I employed, although I am not aware that there can be any important difference. In many instances, it increased the distressing sensations of the stomach; in some it brought on the burning pain, and appeared to accelerate the symptom of black vomiting. The patient frequently remarked, that it burned his stomach like coals of fire, instantly after swallowing it. Very commonly, it tended to produce a dysenteric state of the bowels, with a *tenesmus*, and, in all such instances, it unquestionably hastened the destruction of the patient, by augmenting the degree of inflammation. In some cases, although it was not a general feature of the disease, the vomiting was so pertinacious, that, in order to exhibit any remedy, it became an essential object to check it. For this

purpose I have given the turpentine, in extreme as well as milder cases of the disease, but have found it to be either totally inefficient, or to make matters worse than they had been. It appeared to me, although I do not positively assert it, that, after death, the dissection exhibited more inflammation in those cases, where this medicine had been administered, than in such as were managed in another way. It did not accompany the recovery of any case attended with black vomit, although free hæmorrhages from the stomach and gums occurred in two instances, where the patient got well. Perhaps these hæmorrhages might have contributed to that event, as it appeared to me, that sometimes discharges of blood were critical and curative. On the whole, I do not advise, that this remedy should be lost sight of, but it appears to me, to be so doubtful in experiment, and so hostile to the principles of the disease, that it cannot be relied on with much confidence. It was administered in doses of 30 drops every half hour, in a syrup, sometimes in smaller quantities, and, in one instance, the dose was increased to 60 drops every half hour. I mention the portions in which I employed it, that others may profit by varying them, if I have erred in that particular. The use of this medicine was suggested to Drs. CHAPMAN and HEWSON, in Philadelphia, by its reported efficacy in *puerperal* fever. What analogy there is between these diseases, I am not able to say, even admitting the efficacy of the remedy in the latter: but it is certain, that their seat is different, and what, from that circumstance, might prove beneficial in the one, might have an opposite effect in the other. The pathology of the disease, as discovered by the symptoms before death, and by dissection after death, (for, until I dissected, I had no accurate idea concerning it,) leads directly to the treatment. In the milder cases, as the various grades of Intermittent and Remittent fever, the stomach being yet only in a state of irritation, the remedies are evidently such as are calculated to allay it, and

to prevent its running into actual inflammation. In the more severe cases, as in the continued forms of fever, the stomach passes into the state of inflammation, and calls for remedies, which are suited to its tender and sensitive condition. The treatment, which experience has dictated for the Epidemic Intermittent and Remittent, is of a bold and powerful nature, consisting of blood-letting in a greater or less degree, according to circumstances—of strong evacuants, by *emesis* and *catharsis* blisters, and of mercury. Stimulants and tonics are so seldom admissible, except in certain intermittent cases, that I do not recollect even to have succeeded with them in a single instance. Where the disease is very severe, and often fatal, calomel, as a salivant, has been found useful, and has been accounted, by some of the elder practitioners, as almost specific. In the less violent cases, the depleting method is commonly and advantageously relied on ; but when the force of fever becomes higher and more destructive, it fails so often as to produce the necessity of employing more efficient means. It leaves so much to be done by the powers of nature, for really it professes no more than the removal of obstacles to the curative process, which is performed or attempted by them, that they cannot be confided in exclusively. The powers of nature, in such cases, are too feeble to resist and subdue the disease, with their assistance alone. A remedy is demanded which can cut short or mitigate it, by translating excitement from a part which is so vital to one which is less so. *Sthenic* medicines aggravate the evil ; *asthenic* medicines cannot reduce it, notwithstanding any reduction of the fluids or excitement ; and blisters are incapable of diverting it. Under these circumstances, mercury has been resorted to, with the most happy results ; and although it does not succeed universally, it has filled up a considerable space in the deficiency of remedies. It sometimes fails, in consequence of some unknown peculiarity of constitution ; but much oftener because it is not employed sufficiently ear-

ly, or in doses sufficiently large. It has been objected to this medicine that it proves beneficial in cases only which are mild and manageable by the common antiphlogistic means, while it is ineffectual in those which are of severe and more malignant grade. The objection is plausible, and not entirely unfounded ; for it unquestionably fails sometimes, in consequence of the superior hold which the morbid action has acquired on the system, in the same way that laudanum or brandy produces no effect in *tetanus*. There seems to be no room left for its operation, or, in still more analogical language, the whole attention of the body appears to be drawn to another object, with which it is exclusively engaged. Such instances do occur, and it is confessed that the medicine is completely baffled by them. But as the opponents to the remedy have conjecturally attributed success to it in the milder cases only, might not its want of success, in these instances which have been alluded to, be conjecturally attributed, also, to a violence of disease, which would have just as effectually resisted all the ordinary means of treatment ? For, it is owing to the well established inefficacy of such means, in the higher grades of fever, that mercury has been employed, and so much anxiety has been felt for new and more cogent medicines. The question then, at last, consists in this—Will mercury, which, it is admitted, frequently fails to conquer certain high grades of fever, that are not more manageable by the common modes, succeed in any cases which are beyond the reach of such modes ? There cannot, I think, be a doubt of it. There is scarcely a practical man in this City, who is not convinced, that there is. A patient is found, to be affected with symptoms, which, at the same period, are commonly incident to the cases, which, under the ordinary remedies, terminate mortally, being treated with mercury, recovers or improves, from the moment a salivation is established. Is it not logical, to ascribe the recovery to the medicine, and to rank the disease above that

milder grade, which comes within the controul of ordinary remedies. What other method have we of determining the comparative efficacy of different modes of treatment? What other method have we of determining the efficacy of any mode, than the repeated successes which are immediately subsequent to its employment? Even without regard to similarity of symptoms, the incertitude of which I have already spoken; it is correct to attribute the instant benefit and final cure, which result from the appearance of the salivation, to that event, whenever the prevailing type becomes malignant, and is commonly fatal. For there are cases which tend to the destruction of the patient, which are seasonably mitigated, or broken up, by the influence of the medicine, before they arrive at their utmost violence, and become so firmly seated as to preclude its operation on the system altogether. Cases of recovery have always two mild stages, and an intervening stage of greater severity. Cases which end in death, have a mild stage, and a destructive one, which the system is unable to resist. The propitious moment for the administration of mercury, is antecedent to the accession of the violent stage, and during the progress of the first mild stage. If it be administered afterward, it cannot succeed very often in the one species of cases, and, in the other, its effect is not likely to be produced, until the establishment of the second mild stage, when it becomes totally unnecessary. This is the manner of using this medicine, which has brought it into discredit with many practitioners. Other remedies are resorted to in the first place, and when they are found to be ineffectual in checking the growing force of the disease, then mercury is exhibited, at a desperate stage, when the system has been wholly engrossed, and no room left for its influence. There is a type of our Remittent fever, in which it is undoubtedly useful. The disease is obstinately lengthened out to thirteen, seventeen, or twenty days, and does not assume its worst features until a late period. It slowly and

gradually ascends in violence under the common treatment, and finally, becoming worse and worse, destroys the patient. Every practical man in this City, must have on his memory a type of disease thus characterised. It is obstinate and fatal under the mere asthenic management, but yields very promptly to the influence of mercury. Properly employed, there cannot be a doubt of the great importance of this medicine in Remittent fever. It is true, however, that it is attended with some disadvantages, even when the system submits to its usual effects, or mode of operation, and that it sometimes irritates the bowels and aggravates the disease. There is what, by a solicism, has been called a *dry salivation*, in which the excitement of the glands is excessive, without any secretion of saliva. That state of the glands is evidently occasioned by an inflexible degree of the morbid action, since I have seen the flow of saliva become profuse in the remissions, and suppressed in the exacerbations. Such a tendency of the medicine, not only promotes the irritation which has been caused by the disease, but sometimes produces mortification of the cheek, and, in this way, becomes itself an immediate agent in the destruction of the patient. This effect of the medicine generally occurs, where depleting and antiphlogistic remedies have not been premised, and where the disease passes rapidly thro' its first and milder stage, into its second and virulent stage; thus rendering its effect contemporary with the period of the latter. When the critical duration of the prevailing type of fever is very short, it presents an objection to the use of mercury, as a salivant, of much more magnitude, however, than any other. In order to produce its effect in time, the doses must be made very large, and the administration must take place very early. So that, in consequence of the latter, the effect of dry salivation, just now alluded to, is apt to supervene, and, in consequence of the former, the bowels are liable to be irritated. The benefit of the medicine is not only lost in this way, but, the bowels being injured, the disease

which I have represented to be seated there, is aggravated and made worse, while the patient is debilitated, and made less able to contend with it. From these circumstances, mercury fails very often in cases of short duration. Small doses cannot make any impression, and large doses have a tendency to affect the bowels, and run off. Yet, from the constant failure of the ordinary remedies, and the occasional success of this, it appears to me to be worth the hazarding. It is acknowledged to fail very often, but it sometimes succeeds, and there is nothing better. When the disease has become aggravated still more, from the worst form of Remittent to the Continued type, and when the Continued type is contracted from five or six days to three, the probability of success with mercury becomes correspondingly lessened. And I do not hesitate to say, that, when it has been cut down, by its force, to a critical duration of that last short term, the present fund of medical knowledge furnishes no remedy. It is vain for those at a distance from the scene of action, to talk of blood-letting, of calomel purges, of mercury as a salivant, of saline cathartics, of demulcents, of emetics, or of stimulants. They, and all the present *materia medica*, are as ineffectual as a bull-rush against the Nile. Graduate them in any way—use the utmost skill in adapting them to the various conditions of the system, they are nugatory. And, if I have given a correct pathology of the disease, is it to be wondered at, that more or less of cases should outstretch the limits of our science, or even that they should be altogether remediless? Why should not certain grades of fever place the system beyond the possibility of repair, as well as certain doses of the various poisons, when swallowed; as arsenic, or sublimate, or sugar of lead, which, having once excited their peculiar morbid effects, do an injury which it is not thought unaccountable that the energies of the constitution should sink under, in spite of medicine? It is, unfortunately, too common for physicians to conceive every case of fever within the power of remedies, if

those remedies were known. So that, when a patient dies, after having been managed according to the established principles, the failure is ascribed to the defect of the principles, and not to the incurable hurt which has been received. In consequence of this, principles are abandoned, and specifics are resorted to, which, if the search after them were conducted prudently, would be reasonable enough. But, instead of an enlightened investigation, it becomes a mad pursuit, and success is imagined sometimes under the influence of enthusiasm, which is unfounded, and remedies are published and supported in books, which, at the trial, are ascertained to be mere trash. In the treatment of the Continued form of the Epidemic of 1820, specifics, as well as principles, were unsuccessful, in the majority of cases. At the beginning, I did my duty, and adhered to the asthenic remedies and to mercury, until they became unequal to the force of the disease. I then abandoned them, as regards the Hospital practice, and employed stimulant specifics. They did not afford me more benefit than principles. In the latter part of the season, I think my success was a little advanced, by a return to the asthenic remedies, applied in a different way. In the first part of the season, I used blood-letting, active cathartics, blisters, and mercury as a salivant. In the latter part of the season, I used small doses of castor oil, demulcents, acid drinks, blisters, and sometimes I ventured on mercury as a salivant. I was induced to abandon blood-letting, after employing it in three instances at an early period. Experience in former Epidemics, had taught me that, in the highest grades of fever, it ought not to be used. But I ventured in these cases, and failed. I was invited to this remedy in one instance, by an *epistaxis* which took place on the second day: but afterwards learned, that spontaneous hæmorrhages were by no means a proof of its propriety. I have seen them repeatedly take place in a low state of the circulation, and often at the closing of the disease in death. In the instance here

alluded to, a hæmorrhage from the bowels took place after the *epistaxis*, notwithstanding a very free use of the lancet. This hæmorrhage consisted of healthy-looking blood, not in the least dissolved; and indeed, such was the appearance of all the blood, discharged spontaneously, or otherwise, in this disease. It appeared to me, that the arteries were in that kind of state, which could not sustain so much depletion as attended the remedy. They certainly could not, at any moment after the first day. I think, in some instances, where this remedy was employed more freely by others, if it did not hasten the progress of disease in the stomach, it did not retard it. Black vomit, I am told, took place, notwithstanding the most copious venæsections and evacuations. This disease is a local one; it is an *erythema* of the internal surface. General arterial actions are secondary, and where they have been reduced by the crippled condition of the internal surface—where they have lost the support and strength of the stomach, general bleeding only makes things worse; they are reduced too much for the sustenance of life. The circulation retreats from the extremities, and death takes place, almost without the appearance of disease, in many instances. If there be any moment for bleeding, it is at the onset. The progress of the disease soon debilitates the general circulation too much to bear it. That moment is very frequently lost, before the physician is resorted to. It is in the first part of the tumultuary stage, which, I have said, until late in the season, lasted but three days. Not more than one patient in five came to the hospital, during this period. It was only in my private practice, that I had many opportunities of seeing the disease, from the first moment of attack. But Dr. COTTON, who had the care of the Hospital, before his death, in the earlier part of the season, told me, that he succeeded with the lancet there, while he was, at the same time, in his private practice in the City, very unsuccessful with it. It appears from this, that the disease was mitigated, in some degree, by the vicis-

situde from town to country air; and renders it probable, that blood-letting was a much better remedy in 1820, as in former years, in the less severe cases, than in those of higher grade, when the attack on the stomach was more powerful and inflammatory. The Doctor also informed me, that he was compelled to lay aside the lancet, which he had employed so freely, as the season advanced, and the disease became more aggravated. He then resorted to mercury as a salivant, and, from my personal observation, did succeed in many cases. His plan was to commence with 5 grains of calomel every two hours, without premising it with any other remedy. I pursued the same course in the City, but with much less success. This remedy afterward failed almost uniformly, in consequence of the very short term, which preceded the accession of inflammation in the stomach. As soon as that occurred, the calomel, so far from doing good, either ran off by the bowels, or promoted the inflammatory affection to black vomiting. I never saw it, at this period, produce a dysenteric irritation, or frequent small passages, without increasing the burning or tenderness of the stomach. Sometimes, indeed, it appeared to produce that effect, without those conditions, and, I am well assured, is a most improper medicine, when the stomach is in the slightest degree inflamed. It was very remarkable, that the bowels, as the Epidemic progressed, became more easily operated upon by medicine, and were more liable to become dysenteric. At its close, one table-spoonful of castor oil was an abundant dose, and more than that quantity was attended with an unnecessary number of evacuations. Such an irritable state of the intestinal tube, was another obstacle to the mercurial remedy. If a small dose was given, it could not establish its influence early enough. If a larger one was given, it almost certainly produced the consequences which have been mentioned. The general plan of cure which I adopted, in October and November, was the following:—The bowels were

kept gently open with castor-oil, which I found the least irritant evacuant on the inflamed surface. By this means, the collections in the stomach and bowels were removed as they were deposited, and the vomiting was prevented. The food and drink were entirely constituted of thin arrow-root, acidulated with lime-juice. Sometimes I permitted the patient to take twelve ounces of lime-water, with an equal quantity of sweet milk, in the twenty-four hours, prohibiting all other food or drink. In this way, the vomiting was often suppressed, even after the secretion of the black matter. I found blisters, for the purpose of keeping up an external excitement, very useful, as auxiliaries. Applied to the inside of the upper arms, and when drawn, skinned and dressed with *basilicon*, they afforded a permanent stimulation, and, I think, detracted excitement from the stomach, much more powerfully than a blister applied over the stomach, although that ought not to be neglected. I saw but two instances of recovery after the appearance of black vomit, and this was nearly the treatment which I employed. In one of the cases, blisters were applied over the greater part of the body; the patient took lime-water and milk exclusively, for food and drink, and frequent injections were administered, to keep the bowels evacuated. Towards the last of the season, when the stomach was inflamed almost from the beginning, and even, as in one instance, before the developement of fever, this was not only the most reasonable, but the most successful mode of practice. It was such a mode as is prescribed in CULLEN's first lines for *erythematous gastritis*; and although it only professes to remove obstacles, and reduce the excitement by diversion, thus leaving the cure to the constitution, it is the most successful, or rather the least unsuccessful. At an earlier period, when some two or three days frequently elapse before the inflammation is established, and when the blood-vessels beat with vigor, indicating either a moderate affection of the stomach, or its ability to sustain the strength which it imparts, by sym-

pathy, to the rest of the body, a bleeding at the commencement is a proper remedy ; but, from the experience which I have had, in the first and latter part of the fall, it is to be considered as always a very dangerous one. When the pulse at the wrist is not open, strong and active, (not merely tumultuary, for that is not always connected with strength,) it will accelerate the affection of the stomach. It is nonsense for theorists to talk of oppression in the circulation, and of the rising of the pulse by the extraction of blood. When the pulse appears to be weak in this disease, it is reality, and not disguise. Bleed, and it sinks—never rises. This may be true in relation to phlegmonous inflammation ; but it is false in relation to an erythematous one. In a case of this kind, I never saw a pulse to develope more force and activity after evacuation of any kind. The foundation of a free use of this remedy appears to me to consist in an idea that morbid inflammation is merely constituted of too much excitement, and that it is to be promptly relieved by reducing that excitement.—But there is something more in inflammation than mere excitement ; there is a morbid action, which will remain after the reduction of the circulation to any degree below natural, so that, although it is perceptible that the superfluous excitement is gone, the disease is not cured. The patient being placed in these circumstances, has not only still to contend with the disease, but he is rendered less able to do so, and indeed has debility to combat, in addition to his other misfortune. When the prevailing type is not too rapid, and the inflammation is not immediately formed, mercury is admissible ; but it is out of the question when the inflammation comes early. After the establishment of this state, the mild treatment which I have recounted above, is that, which every judicious man will resort to, after going the round of experiment. I have said nothing of emetics, or drastic cathartics, or sudorifics, in this form of the Epidemic, because they were generally, as it would be supposed, either useless or hurtful. There were

some cases, in which emetics might have been advantageous in the beginning, and I think, from the few trials I made with them, that they deserve to be more used than they were. When the disease has made some progress to inflammation, they are of course out of the question. I think, in one instance, where an emetic had been given too late, the progress of the case was hastened, and black vomiting came on earlier than it would have done. Strong cathartics were very injurious, not only by aggravating the disease, but by inducing general debility, and establishing the passive stage prematurely. Sudorifics, when stimulant, were inflammable and hurtful—when composed of nauseating doses of antimony or hippo, they harassed the stomach, without effecting any counterbalancing benefit.

I made use of cold water, applied to the body by sponging, and, in one instance only, by affusion. It was an excellent auxiliary, but did not make so powerful an impression as I expected from it. It is probable that I relied too much upon the affusion, in the case in which I employed it, or it might have succeeded better. The patient was always revived and much more comfortable; his pulse became fuller and softer—his mind and sensibility restored to their sound state. This remedy was not sufficiently used, because, in many cases, the want of conveniences rendered it impracticable; and, indeed, the season had nearly elapsed before I was convinced of its great efficacy. The mild treatment which has been mentioned, in conjunction with the affusion, would probably afford more good, in the extreme grades of such an Epidemic, than any other means. Under similar circumstances, I should generally prefer them to every thing that has come under my observation. In certain cases, cold water cannot be applied, as where the patient is incessantly either liable to, or actually suffering the influence of chills. I was unfortunately defeated, in consequence of this, in attempting the affusion, in one very interesting case, which terminated fatally. The patient

shuddered at the bare mention of it, and when he was placed in the position to receive the water, he was seized with a convulsive rigor. The chills continued in this case until death, without leaving any room for this remedy. But the little trial I made, was sufficient to inspire me with the utmost confidence in it, as an assistant instrument in the treatment. It can never subdue the disease when employed alone, although I might venture to say, that, in the majority of cases, it would yield more essential advantage than any medicine whatever. The good which it does is prompt and obvious, and entirely arising from itself, which cannot be said of other remedies. In former seasons, I have used it freely, and do not recollect ever to have been disappointed in its efficacy to a certain extent. Affusion is better than immersion, though the latter is serviceable when the former is impracticable, as is often times the case. After all, however, no rules, nor remedies, were applicable to all cases. A diversity of secondary affections pointed out various modifications of the means, which had been selected as proper. In some cases, the bowels were irritable, and mercury, as a salivant, became inadmissible, although, in many other points of view, it might have been an appropriate remedy. In others, the stomach was so sensitive, as to reject oil, and then perhaps it became requisite to substitute a *saline cathartic* for it. Sometimes it rejected every thing, and all that was left for the Practitioner to do, was to pacify it; which was often impracticable, and then he was reduced to be almost a mere looker-on. The circumstances of cases were thus modified in various ways, and called for the utmost skill of the Practitioner to provide for them. The disease not only assumed different shapes, but different degrees of excitement: so that, there could be no greater folly than that, of assigning any one medicine, or any set of medicines, as the most efficient in the treatment. The disease is inflammatory, and seated in the stomach and internal surface. The reme-

dies are such, as are calculated to resolve it. The particular means for that purpose must be adapted to circumstances.—Fixed selections, however well contrived in the closet, are not practical, and never can be useful at the bed-side of the patient.

NOTE.

Sometimes, the terms *Disease* and *Fever*, as used in this **REPORT**, are used to apply, not merely to the whole Epidemic. but particularly to the *continued* form of it ; as if such form were considered a distinct disease, or fever.—This Note is inserted, therefore, to leave no room for doubt or misconception.

Savannah, 23d January, 1821.

DEAR SIR,

THE favor you conferred, in reading to me the *manuscript* of your *Report to the City Council, upon the origin, causes and progress of the late fatal Epidemic*, gave me much pleasure ; and I freely comply with your wishes, by stating to you my opinion, and in according to your *Report*, my full and entire concurrence.

Your views on the subject of our fevers, in point of character and origin, correspond with the observations I have made, in a *thirty years' practice* in this climate ; and the *last year* presented to us the fever of *warm climates*, in its various grades, from the Intermittent to the Continued form ; and fully confirmed the opinion I have long indulged, of their identity of character.

Your *Report*, I am persuaded, will have a salutary influence, in correcting many false notions, indulged by our people, and much false theory among professional men, on the subject of *Yellow Fever*.

I am, dear Sir,

Respectfully,

Your obedient servant,

LEMUEL KOLLOCK.

DR. WARING.

